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Standards Bureau Studies Synthetic Rubber

WHETHER or not the results be of immediate advantage, the fact that the Bureau of Standards is testing samples of synthetic rubber indicates at least that that helpful office deems such tests important. The bureau heads may also have a strong impression that conditions are peculiarly favorable for the production soon of a scientifically made material that for many practical applications will be rubber to all intents and purposes. Strengthening such impression is not only the unwonted activity among chemists in this country, but also the extensive research work being done in England and Germany toward the same goal.

The age of synthesis is here, and its activities are broad, growing, and numerous. Vegetable oils now yield a hard fat that replaces that of 7,000,000 hogs; fixed nitrogen and synthetic ammonia have routed the fears raised by the exhaustion of the Chilean nitrate beds; acetylene has given us cheaper acetic acid; instead of by expensive wood distillation, we can now make methanol (wood alcohol) from hydrogen and carbon monoxide; butyl alcohol is made cheaper synthetically than by fermenting corn; and ethyl (grain) alcohol is now synthetized and may soon be marketed much below present cost.

Extensive is the production of synthetic flavoring extracts, dyestuffs, silks, medicines, and even glandular extracts, in which standardization has been effected in a way impossible with natural products. Yet when each man-made substance was first marketed the most dire predictions were made regarding the fate of the originals. The dreaded crises, however, did not prove calamities after all. Syntans have not yet excluded quebracho and other tanning agents; synthetic quinine has not displaced cinchona; hard rubber holds its own well against the synthetic resins; natural silk will always be in favor even though the raw materials for rayon (cellulose) silk cost little more than cotton; and despite the advent of Italian wood wool, the fleece of sheep will always be prized.

If good quality commercial synthetic rubber appears it will be welcomed. Even though costing 50 cents a pound, it should prove the best kind of a crude rubber stabilizer. Nor should its use mean lessened consumption of the natural product, for newer and greater uses would be found for each sort, and excellent blends of both may be made in ways now unimagined.

How Modern Equipment Benefits

RUBBER manufacturers who are still wedded to old ways, and believe that they can double production only by doubling the number of men and machines, could profit by the experience of one of the most successful tire and tube making concerns in the West. This progressive company, although having considerable up-to-date machinery and conforming to standard practice, began scarcely four years ago, to make its entire works a 100 per cent installation of the most modern equipment and to adopt the most efficient manufacturing methods yet devised.

The first year's record proved the wisdom of its course. It produced an average of 2.21 tires and tubes per man daily. The second year this grew to 3.52; then 4.42; and latterly 5.37 for a year. The management is confident that the record will be even better for 1926, for which period it aims to score a unit production of at least 5.50 per man daily on ordinary working time.

The case here cited is but typical of many another, less striking perhaps but equally illustrative of the benefits of rightly directed economy in factory work and equipment. Economy may also take the form of time saving, as in the use of the most effective accelerators, vulcanizing periods being thus steadily shortened, with a yield of superior products. Improvement is being continually made in formulas and in the selection of compounding ingredients, to reduce time and yet produce more and better goods. With better marketing methods, too, rubber manufacturers are making it possible to lower prices to consumers.

Tires sell for less than half the price they brought six years ago, and they last twice and thrice as long. Surely such enhancement of the buying power of a dollar by enterprising manufacturers is of more service to a community than mere abstention from buying, as has been advised, to confound the knavish tricks of speculators in raw materials. The difference is that between adding to the general wealth and retarding prosperity. Plainly the American rubber industry is doing its share toward promoting real economy. It is cooperating in a rational way with those leaders who would have us cease our wasteful ways and add to our efficiency so as to make the nation's industrial position more impregnable than ever.

New Zealand Tries Restriction

JUST as rubber buyers had noted with much satisfaction a drop in crude prices from the $1.20 peak to around 60 cents, automobile manufacturers found themselves confronted with a situation not unlike that which had given rubber buyers much anxiety. Hoping to profit as did the Federated Malay States and Ceylon through rubber restriction, New Zealand has enacted a law controlling the price and production of kauri gum, a substance much used in the United States for motor car varnishes and to some extent as a rubber compounding ingredient.

While the government contends that the law is designed for needy producers, the chances are that this measure contravening sound economics will, as in the case of rubber, benefit not so much gatherers of kauri gum as speculators in the commodity. While New Zealand is quite within its rights in thus disregarding the normal movement of trade, the regret is that it adopts a policy which the commercial world had hoped would soon pass into the discard, and which at best can give the commonwealth but temporary advantage.

Secretary Hoover occasioned surprise by flatly opposing British colonial restriction of rubber, but it was not the consequent price rise which gave him so much concern as the fear that the success of such restriction might embolden other nations or their dependencies to emulate the British colonials and corner other commodities. The restriction idea might become an epidemic, and politicians using it to curry favor might cause trade squabbles serious enough to threaten war.

An experience of three and a half years with rubber restriction bears out the contention made at the outset by its fairest critics,—that while it would improve prices and encourage fresh planting,—two needs then freely conceded,—it could not be depended upon to keep prices long above a just economic level, nor could it prevent the development of powerful antagonistic enterprise. Just as these adverse factors have since manifested themselves in rubber raising, so will similar influences soon compass the defeat of schemes for restricting other raw materials, such setback being hastened, too, by trade reprisals and the development of substitute products.

New Impetus to Tire Making

OUTDONE perhaps only by the amazing growth of the radio industry is the development of motor omnibus transportation in the United States. Ten years ago the routes of motor car lines totaled scarcely 5,000 miles, and the vehicles used were only a few cheap "flivvers." Today such lines total over 566,000 miles, the increase last year being about 32 per cent. A great many of the vehicles now used are produced by the makers of expensive passenger cars, and compare in comfort and luxury with Pullman coaches. The motor omnibus is even vying with the Iron Horse in transcontinental service, with just as few changes and many unique advantages.

The total railway mileage of the country is scarcely half that of the motor car lines, or 250,413; yet it has taken three-quarters of a century to weave that network of rails. True, many of the railroads had to blaze trails and had to carry on under most discouraging conditions, whereas the motor car lines have been favored with ready-made roads, smaller initial outlay, and lower operating expense. But that should not dim the luster of their achievement in rallying in such might to the relief of the nation when inadequate railway expansion seriously hampered the movement of people and merchandise.

If the fainthearted in the rubber industry who have been fearing early saturation in automobile production would study the rise and possibilities of motor car transportation, they would find little to justify their fears. Indeed, it takes no prophet to forecast considerable prosperity for those tire and tube makers who took the more cheerful view and are now well equipped to meet the needs of the fast gathering host of motor omnibuses.

The Truth About Philippine Rubber

The following article is based on more than twenty-six years' residence in the Philippines, twenty-one of which has been in the successful growing of rubber. The writer is Dr. J. W. Strong, managing director of the American Rubber Co., Isabella de Basilan, Philippine Islands.

THERE is ample unoccupied government land located on the islands of Mindanao, Basilan, Jolo, Tawi Tawi and Palawan, to grow all the rubber America requires. The present land law permits buying 2,500 acres of agricultural land and leasing an equal amount by a corporation. This area is a good economic unit for rubber planting. Were it permissible to hold larger areas, they would certainly be split up into similar sizes for advantageous management. Why not start it off in that way? Here is how it could be done, without violation of our land or corporation laws.

We will presume that 50,000 acres are to be planted up and a company has been formed to finance it with $7,500,000, the necessary capital. The company should be incorporated under the laws of the Philippine Islands, for the purpose of financing and promoting rubber planting, acting as agents, and for such other purposes as the by-laws and corporation laws permit. The head of this corporation should be a real executive, and have on his staff expert planters and agriculturists, to act as visiting agents for the various plantations; expert buyers, accountants, civil, mechanical and sanitary engineers, also an efficient legal department.

Once our holding company is in working order Juan de la Cruz associated with four other citizens, Filipino or American, having located an area of 5,000 acres of excellent land on the south coast of Basilan, approaches the company as to the possibilities of financing the project. The company's agriculturist inspects the land, the secret service department reports favorably on Mr. de la Cruz and his associates, and the legal department prepares and files the papers for the proposed corporation.

As soon as the new corporation is organized, the land is applied for as purchase and lease. The capital stock should be $750,000. Directors and officers are elected, and an agreement made whereby the holding company will underwrite the stock of the new company and act as its managing agent. To safeguard the former's interest, the manager and majority of board of directors should be named by the holding company.

Nine other corporations organized in the same manner and located at various points on the south and east coast of Basilan could be managed by the parent company most efficiently. As all requirements would be similar, purchasing in large quantities would cut down costs greatly. The equipment would be standardized, and each plantation would have the benefit of the company's planting expert's advice, engineering, legal and medical service at small cost. Each plantation's accounts would be kept by the holding company and a full interchange of ideas maintained between managers. The company would maintain a large launch at Zamboanga headquarters for transporting supplies and labor to the various plantations. A well-equipped hospital, centrally located, would be used by all the plantations at a pro rata charge. A recruiting agency in the Visayan Islands would supply suitable farm labor to the various units, and as there would be no "crimping" of labor by one plantation from another, labor troubles would be small. All buildings on the various units would be standardized and business methods coordinated by the holding company.

When the plantations are in bearing, each estate would produce standard smoked sheet only, which would require only small power and light machines. All scrap rubber and bark parings would be sent to a central cooperative factory for treatment, where they would be made into one standard "compo" crêpe grade, and the entire output would be marketed cooperatively. The holding company could manage 50 corporations as well as ten, located in other islands. It would only mean additional personnel and cash.

The amount of labor required to plant up and bring into bearing 50,000 acres of rubber would of course depend on the speed with which it was done, location, class of land, whether cut over timber, scrub or grass. About 10,000 laborers would be required for the work and the whole ten units could be entirely planted up in not more than five years from start.

When in full bearing each unit would require a daily tapping force of 600 tappers with probably 100 other laborers for general upkeep work and the necessary foremen and factory crew. One American manager and two white assistants would be required on each unit. Probably it would be necessary to recruit 75 per cent of the labor requirements from the northern islands for any location in which work was started. This would be necessary in order not to disturb local labor conditions.

Filipino labor is entirely different from any other oriental labor. Here we have no coolie class but an independent small farmer. The desire of every Filipino is to eventually secure a small piece of land for a home. As Mindanao and the southern islands have great areas of unoccupied land and the northern islands are densely populated with very poor people, there is almost an unlimited number of potential laborers anxious to go there. In locating plantations, ample land should be left between two or more units and adjoining them for laborers to locate as homesteads, and it should be one of the manager's duties to see that each of his Filipino staff had a small homestead adjoining the plantation. In this way each unit would surround itself with a potential labor force, in addition to its own resident labor force, and would have little or no labor troubles. The Filipino laborer is very easily led and hard to drive. He understands a square deal, and on the whole, is intensely loyal and partisan to the *amo*, or "master," whom they call the "old one." Once settled on or adjoining a plantation, they soon consider themselves a part of it.

It is true that the average wage of $0.50 gold per day without food is somewhat higher than in other oriental countries, but this is more than offset by the far greater efficiency of the Filipino laborer. One who has watched a gang of Tamil coolies at work on a rubber estate in the F. M. S. or on the public roads there can readily understand this.

It is believed that the government would assist a project of this kind, as the Filipino would be the gainer in every way. It would open up many thousands of acres of land for small homeseekers that are now monkey reserves and breeding ground for locusts. It would relieve congested areas and settle up the now unsettled Moro country, and would eventually settle the Moro problem. Thousands of Filipinos and non-Christians would be placed under much better sanitary surroundings, and get to know and respect each other.

On Basilan rubber estates, Moros of half a dozen tribes and Christian Filipinos work side by side, play baseball together, and their children sit side by side in the plantation schools, all without friction or trouble of any sort. So much for plantation influence, and it is very great.

With normal conditions, that is, no wars, or financial panics, and cooperative planting, as outlined, an acre of rubber should be brought to the end of the fourth year (from planting) for $150.

per acre, counting interest at about six per cent. Beginning the fifth year tapping would start over some one-third of the area with a probable output of 100 pounds per acre for the first year and a probable all in cost of $0.30 gold per pound. When all of a unit was in full bearing, say, end of 10th year from planting with 4,800 available acres (200 off for roads, building sites, etc.), the output should be at least 350 pounds per acre with an all in cost of not more than $0.20 gold per pound.

We are in a particularly favorable position, and one that should be grasped at once if we are to produce our own rubber. Our position is analogous to a manufacturing industry producing a world-wide necessity with costs cut to the lowest point. All plants are using identical machinery and methods, and production costs are pretty much the same all over. Then comes an inventor perfecting machines and methods that will produce three to four times the output at the same cost. This being the case, it is evident that new factories starting up with new equipment would be able to produce far more cheaply than the old plants that would have to struggle along with the old equipment, because they could not be scrapped.

In a rubber plantation it is a well-known fact that there is no uniformity as to yield; 75 per cent of output is produced by probably 30 per cent of trees planted. In order to raise the yield per acre and cut tapping costs, poor yielders are systematically cut out, but this takes a long time and is expensive. Seed selection has helped in a limited way, but is unsatisfactory, as Pará rubber flowers are not self fertilized, and seed from high yielding trees may have been fertilized by a very poor yielder. It is also generally recognized that poor yielders produce far more seed than do good yielders. This being the case, it is evident that the problem had to be attacked from a different angle, which our Dutch friends in Java have successfully done, i. e., bud grafting.

The method used is very simple. Buds taken from carefully selected high yielding mother trees are shield grafted into young nursery plants, from six months to two years old. The bud is inserted as near the ground as possible, and after the shoot has started the stock is cut off, so that the resulting trunk will be a high yielder. By this method the Dutch have succeeded in increasing yields of from 350 pounds per acre to as much as 1,000 pounds and more per acre, and it does not cost any more to tap a high yielding tree than a poor yielder. Many hundreds of acres of budded rubber have already been planted out in Sumatra and the Federated Malay States, and it is safe to say that little or no rubber will be planted there in the future, except high yielding budded rubber.

We have an absolutely clean slate here in the Philippines. There is ample material at hand, seed for nursery purposes from well-grown healthy trees, and many thousands of fine heavy yielding mother trees from which budwood can be secured. There are many well trained Filipinos from the College of Agriculture, University of the Philippines, the best school in the world teaching tropical agriculture, who are quite familiar with this sort of work.

Arrangements are now going forward toward cooperation research work along this line by one of the present rubber plantations on Basilan and the Philippine Bureau of Agriculture, the benefit of which, needless to say, would be available to future planters. In this way, the rubber commission's estimate of a possible 70,000 tons (which the writer considers very conservative) could be raised to more than 200,000 tons from same acreage, and available labor with materially increased wages, at a less cost than elsewhere, and at a greater profit to the investor. This could all be done if we would simply get busy, use our heads for thinking and not for talking, especially about Philippine conditions, land laws and labor. The land laws are quite satisfactory, and workable, as outlined above. The best legal talent in the Islands has assured the writer that the plan is perfectly legal. The labor is available and efficient, the writer has been using it for more than twenty years, and not guessing at it.

The rubber shortage will begin to pinch real hard about the beginning of 1927 and prices will be good for many years to come. Why not get in on the ground floor, help America to produce her own rubber, and at the same time have a well-paying investment? The writer has refrained from touching on the political side of the question, as he considers it negligible. The development of our unsettled raw land by rubber plantations, by Christian Filipinos from the overpopulated northern islands, is so obviously to the advantage of the Philippine Government and people, that even a politico could see it, without a diagram. Our politicos are not all so "dyed in the wool" as they are often painted.

Measuring Surface Temperatures

In rubber working the need has always been felt for some means of measuring the surface temperatures of mill and calender rolls, press plates and other hot surfaces coming in contact with pure gum or compounded stocks. Heretofore, the only means available has been the approximation obtained by touching the surfaces with the hand, dry or slightly moistened, and it is remarkable how an experienced rubber worker can judge a suitable working heat in this way. Now, however, there are available thermocouple instruments built for closely indicating the temperature of either flat or curved surfaces provided their heat is not less than 200 degrees F.

FIG. 1. THERMOCOUPLE FOR FLAT SURFACES

The first of these surface contact thermocouples is that made for flat surfaces adapted for determining the heat of press plates. It is pictured in Figure 1, and is used in conjunction with an indicating pyrometer. The thermocouple itself can be made in a variety of ranges up to about 2,000 degrees F. which is, of course, far in excess of any rubber working requirement. It has an aluminum face for quick heating and cooling. The surface plate is about 3 inches in diameter. The instrument is 18 inches high and is equipped with standard thermocouple binding post for connection to cold-junction extension cable and meter.

FIG. 2. THERMOCOUPLE FOR ROLL SURFACES

For mill and calender rolls the instrument takes the form shown in Figure 2. Although taking the temperature of a roll surface is at best a difficult matter, good results are obtainable with the unit pictured. It consists of a hardwood block having a contour of approximately the same arc as the periphery of the mill roll. The block is supplied also with a sensitive thermocouple, which can be connected to an indicating milli-voltmeter with Fahrenheit scale, and the temperature read almost instantly. The unit is sometimes fastened to a hinged rod and pressed against the roll only while the temperature is being read. At all other times it clears the roll. The temperature limit of the unit is 500 degrees F.

Washing Crude Rubber, Balata and Gutta

Tropical Washing Plants—Washing in the Factory—General Equipment—Details of Washing Processes—Cleansing Various Grades of Rubber—Testing the Product—Cleansing Pontianak, Balata, Gutta Percha and Chicle

WASH DAY for the rubber trade is every day in the week, and with Africans, Centrals and pseudo rubbers again coming into use, long idle machinery for cleansing may soon be run by night shifts as well. Hence an exposition of washing practice the world over is decidedly of present and future interest.

Washing Wild and Plantation Rubber

Hundreds of washing machines are required to cleanse both wild and plantation rubber in the tropics. As an instance in the great plantations in Ceylon, the Malay States, Java and Sumatra, French Indo China and a few in Brazil, the Philippines and in Trinidad. The plantation washers consist of 2-roll horizontal wash mills with fluted rolls for squeezing, sheeting and ribbing the rubber. The serum is washed away from the soft coagulum by a copious flow of water which floods the rolls from a perforated pipe arranged above them. The coagulum passes in succession through each mill in the line; the mill rolls being cut to produce the desired crêpe, ribs or smooth sheets. Scrap, barky rubber and earth rubber are also thoroughly washed, sometimes on the regular mills and sometimes on washers adapted for that purpose alone.

The majority of machines are British built and follow certain types. The British, German and Dutch wash mills have horizontal rolls carried in frames inclined at an angle away from the operator. The chief advantage of this form is the convenience it affords for observing the progress of the work. Among the small rubber growers a light two-roll washer is used operated by hand power. Such a machine is adapted only to working on a small scale and is used by native growers.

Wild rubber is also often washed at washing plants in the Far East. The grades known as machined rubber and Indragiri are of this sort.

At the various trading posts in Africa washing plants were once operated and a considerable product of fairly clean rubber obtained. With a profitable market for Africans in sight, they will doubtless come into use again and new plants be installed.

South America also has its washeries for wild rubber. The first plant for this work was established in Bahia, Brazil. The machinery consisted of two washers producing irregularly shaped chunks weighing from ¼ to ½ pound each, and called "Rock" rubber. There was also a 3-roll washing and crêping machine. Washing rubber in the tropics develops difficulties not experienced in the temperate zone. Some of the rock rubber, for example, softens and breaks down before it reaches Europe or America. The Manihot is the easiest to wash and Mangabeira the most difficult.

A rubber washing plant established at Manaos, Brazil, utilizes modern mills for washing Parás, and produces clean dry crêpe. Another rubber washing plant at Pará, Brazil, is equipped with standard 2-roll washers the same as found in rubber manufacturing plants. Here the *pelles* of Pará rubber are handled essentially as they are in the American or European plants and a clean dry crêpe product is exported.

Guayule is derived from a woody shrub direct as rubber and not through coagulation, consequently its method of preparation is unique. Briefly, the shrub is crushed, cut fine in a special mill and the mass pulped in a tube mill to liberate the rubber from the fiber. The pulped mass is soaked in a tank to water-log the fiber which sinks, freeing the rubber that floats to the surface. This is removed, washed and sheeted in an ordinary 2-roll washer.

The only wild rubber free from such adulterations is fine hard Pará, the original method of preparing which has remained unchanged. Even the practically pure balls and hams of fine Pará lose about 18 per cent of their weight by washing although they

J. H. Croockewit

Washing Plantation Rubber in Sumatra

are entirely free from gross impurities. The loss is perfectly legitimate and practically consists of moisture and soluble impurities from the latex unavoidably included by the process of preparation.

Plantation rubber has of late largely displaced that from uncultivated sources, yet the cleanest plantation rubber is sometimes washed. The better plantation grades are washed as a precaution or for special important purposes in contrast with the imperative need by reason of dirt, in the case of wild rubbers. Sheets of first latex crêpe that sometimes show splinters from broken packing containers or dirt admitted through a break in the case, are stripped apart and washed without preliminary treatment. The same is true of moldy ribbed smoked sheets. These grades should always be washed when intended for use in making inner tubes, dipped goods, thin, higher grade calendered sheets, skim coatings and other special uses.

The Firestone Tire & Rubber Co.

Washing Rubber in a Rubber Manufacturing Plant

Washing in the Factory

The great bulk of the washing is, however, done at the factories where rubber goods are manufactured. Indeed, it is essential that the rubber be free from grit and mechanical impurities in order to make satisfactory goods. From the earliest days of rubber working until the introduction of plantation rubber, manufacturers were entirely dependent on rubber from uncultivated sources. It was obtained from wild trees by natives who gathered and packed it by the most primitive methods. They did not neglect to include every variety of adulteration in the form of earth, stones, wood bark, refuse metal, etc. that could be concealed within the rubber.

Rubber Washing Equipment

The equipment of the rubber factory wash room includes soaking tanks, cutters, crackers and washers or sheeters through which the rubber is handled in the order named.

The rubber soaking tank of wood or iron has drainage outlet and open steam jet for heating the contents. Here as a preliminary the rubber is soaked and boiled for varying periods to loosen adhering earth, bagging, matting, splinters, etc., and to soften hard or frozen masses. Much bark and dirt is removed by the boiling operation and the softened rubber requires less power in the subsequent processes of working.

Direct from the soaking tank the softened rubber is taken to some form of power knife to be sliced, incidentally to detect the presence of any exceptional foreign materials, the presence of which might cause injury to the rolls of the cracker. Sliced rubber is more conveniently fed in that form into the cracker rolls. Various types of cutters are suitable for slicing, common among which are the circular power knife, and the hack saw type. The latest crude rubber cutter is an hydraulic press designed to subdivide a full bale of plantation rubber at a single stroke or to slice it into sections by successive cuts with a single blade.

Cracking is the process next in order. The usual rubber cracker has 2 rolls. The machine may be used either as cracker or washer as desired. The rolls vary in size from 8 by 16 inches to 16 by 36 inches and are of cast iron with grooves or corrugations in both rolls milled in spirally about 4 to the inch. End guides prevent the sand, etc., from the rubber from entering the journal boxes. The interval between the rolls is regulated by the adjusting screws passing through the front of the housings. A perforated water pipe is located above the rolls to supply a shower of water on the rubber between the rolls. Below the rolls a metal screen mill pan is placed to retain bits of rubber detached in cracking.

The function of the cracker, indicated by its name, is to crack, break and crush the sliced soaked rubber into rough sheeted masses preparatory to feeding it to the wash mills. The work of the cracker is effected by the cutting action of the sharp corrugations and the differential speed of the rolls.

Any mixing mill may be converted into a cracker and washer by corrugating the front roll. This has been done with mills having rolls 20 by 22 by 60 inches. Such a wash mill has more than double the capacity of two crackers or washers of usual size, particularly if the front roll is provided with a fairly deep circumferential groove, central in the face of one roll, to serve as a drainage for water and grit. This groove virtually converts a 60-inch roll into two of 30-inch length and allows washing the batch as two sheets at the same time while the dirt and water from each sheet has outlet at both edges similar to conditions on a short-roll washer.

Cracking capacity of the two-roll machines varies from 300 pounds in 10 hours on the 8 by 16-inch machine to 2,000 pounds in 10 hours on the 16 by 36-inch machine and still more on a 20 by 22 by 60-inch machine.

One type of mill serves for a washer or sheeter. In wash mills the rolls are either smooth or corrugated as the case may be. The V shape corrugation is preferred because it wears longer and is easiest to recut.

A new departure in the design of rubber washers is the 4-roll type. This machine is practically two ordinary washers arranged one over the other, housed to confine the water used, and so speeded that the rubber sheet is washed under tension as it passes from the upper to the lower rolls. This stretching action tends to dislodge adhering foreign matter, and pipes located beneath the upper rolls spray water on each side of the stretched sheet. The bark, dirt, and other impurities washed out by the upper rolls fall on the lower ones and are carried off at the ends of these rolls which have no guides to hinder the flow of the water borne impurities. Both pairs of rolls are driven, and connecting gears at opposite ends of the rolls give the proper surface speed ratio for stretching the sheet. The machine is nearly automatic and one man can handle two or three machines depending upon his skill and the rubber being washed.

Details of Washing Process

A single passage of the sliced rubber through the cracker rolls under a heavy shower of water suffices to tear it into rough masses reducing it to a form ready to feed into the washer. The effectual removal of embedded grit and impurities from crude rubber is accomplished by stretching, kneading and milling it in sheet form in a continuous flow of clean water. The operator seeks to form a tough sheet from the cracked rubber as promptly as possible, following which he stretches the sheet as it enters the rolls, which have been set iron to iron, in order that the rubber may come through in a thin sheet.

An effective form of washer which gained much esteem among a former generation of rubber men was the hollander or paper engine type. This machine comprised a deep oblong tub with central partition. Small barky sorts of soft Africans were dumped into the tub and cleaned as they floated in the current of water and were drawn under a paddle-like wheel revolving at one side of the tub carrying a set of steel blades which served to shear the rubber as it passed under the wheel and over a lower fixed knife.

Various Grades in Washing

The various rubbers are handled differently in the washing process. Hard fine Pará and other good grades readily sheet without special efforts on the part of the operator who merely repeatedly feeds the cracked rubber between the rolls until the batch unites in sheet form without the need of warming the water except perhaps in winter.

Soft, low-grade rubbers are handled somewhat differently on the washing mill than high grades. Soft rubbers do not knit together as readily nor form as strong a sheet as the hard rubbers. Hence the water applied to the cracked rubber on the rolls is at a mildly warm temperature such as would be comfortably warm to the hands, perhaps 100-105 degrees F. The rubber gathers under the rolls in thin broken pieces which must constantly be fed in masses until under the milling action and temperature it gathers into a sheet. As soon as this takes place cold water is turned on to chill and toughen the sheet and washing then proceeds as in the case of the hard rubber except that less tension is used by the operator in regulating the passage of the sheet through the rolls.

Testing Washed Rubber

Rubber washers apply a simple test to determine if the rubber is washed clean. They rinse their hands in the shower of water above the rolls, then press firmly upon the sheet as it comes up on the front roll. If the rubber is not wholly clean, grit, and other foreign matter will appear upon the hands. When this test shows negative, the rubber is considered clean. Skill in washing rubber is a matter of judgment first in forming the cracked stock into a sheet and then in manipulating the sheet by tension to clean it without excessive milling and leave it as thin as consistent with its strength. Washed rubbers are frequently hung up for air drying and in that case should be sufficiently strong to support their own weight yet thin for quick drying. When not strong enough to hang, the sheets are folded lightly and dried lying on racks.

Cleansing Pontianak

Pontianak and the low grade guttas such as gutta siak, gutta soh, etc., may be washed alone, together or in combination with balata. Low grade guttas require neither soaking nor cracking. Owing to their inability to form sheets after the manner of plastic rubbers the crumb is handled at the wash mill with shovels. The washed stock assumes the form of short, easily broken or torn sheets which are dried and folded on racks.

Balata

Block balata may be washed alone and dried as a crumb or as in the case when it is to be used as backing tissue, it may be washed with gutta siak or soh in a half and half combination. Washing such a combination requires special care and experience.

Block balata comes in bales of a half dozen blocks each about 6 by 12 by 24 inches. Six of these blocks are packed between crossed layers of boards to form top and bottom of the bale which is bound around at right angles across each boarded end with two wire strappings. Through the strapping nails are driven into the blocks of balata. Such bales are opened by cutting the strapping, and removing the boards and nails. The balata is soaked in hot water or boiled until the blocks separate. They are then washed in cold water to prevent their becoming soft and sticky. The balata falls through the rolls in crumbled form, is caught in a deep tray with wire mesh bottom and is shoveled repeatedly through the rolls until judged to be clean, then removed and dried as crumb in a tray.

For backing tissue, balata and gutta siak or gutta soh are washed together in a 50-50 combination sheet form. The combination is made on the wash rolls where the mixed stocks will form a sheet under the influence of warm wash water.

Chicle is chopped, hand sorted to remove the grosser impurities and washed in cool water on rubber mills like pontianak. Its final purification, however, is by hot filtration in special hydraulic filters.

Washing crude rubber and other plastic gums is practically a process of mechanical refining made essential because in the manufacture of the ultimate products tensile properties, proofing, insulation and abrasive wearing qualities, to enumerate some of the important features of rubber goods, can only be controlled by starting with basically clean crude rubber.

AMERICAN MECHANICAL RUBBER GOODS EXPORTS—1925

During the past year the leading markets for American mechanical rubber goods have been the following: The United Kingdom, taking rubber belting valued at $263,850; hose, $364,903, and packing, $64,700. Mexico followed, with imports of rubber belting reaching a value of $299,155; hose, $247,154, and packing, $82,044; while Canada's purchases during the year included rubber belting, $212,330; hose, $153,528, and packing, $123,392. Other important markets were: British South Africa, Cuba, Chile, Argentina, Brazil and Australia. As compared with similar statistics for 1922, British South Africa is the only country representing a decline, in most instances the import trade showing considerable advances, particularly in the case of Australia, Argentina and Cuba.

Design and Construction of a 29 by 4.40 Balloon Tire

Balloon tire construction and design have presented many minor problems for solution but basically the manufacturing processes are the same as for high pressure casings. Before a new tire can be turned over to production, however, the engineering and designing work must be complete, and instructions laid out for every phase of operation. A plant write-up of a 29 by 4.40 balloon cord would cover the following points:

Tread

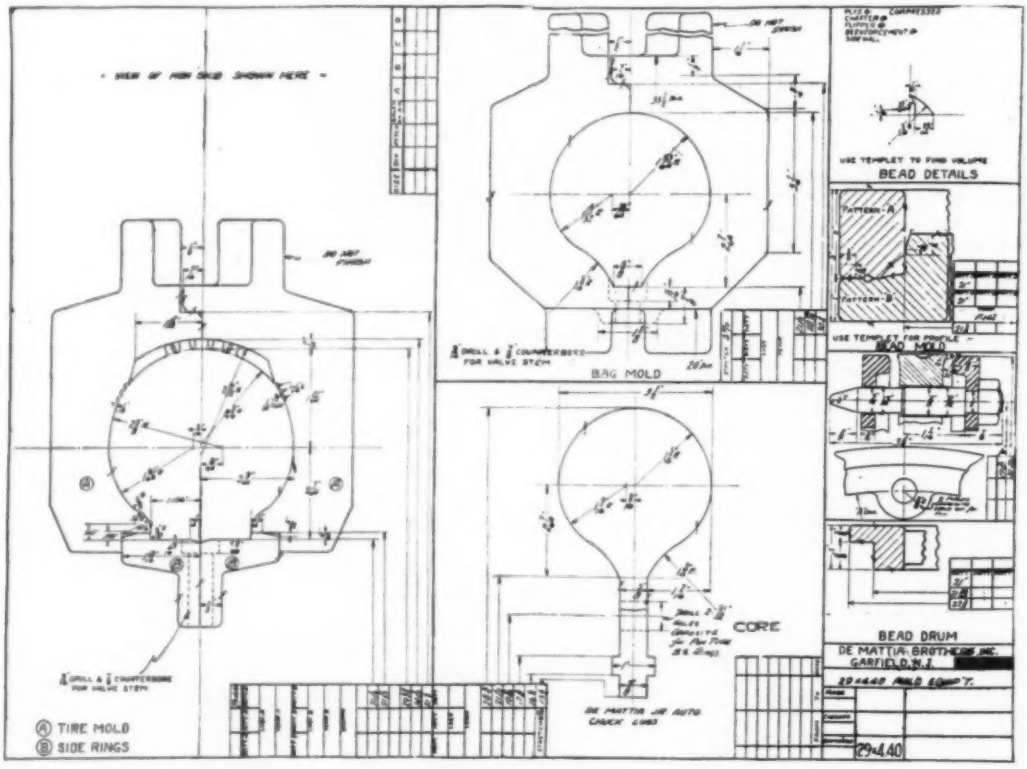
As carbon black compounds are the most widely employed today, the tread stock should be compounded along these lines with due consideration for flowing qualities and hardness of the vulcanized product. Yet the tread must be pliable enough to act in unison with the carcass to give balance to the shoe. Softness in treads should be avoided as it makes the tire more liable to puncture.

There are two methods of making treads, tubing and calendering, both being widely used today. As the tread leaves the calender or tuber, it is first run through a water bath to cool the stock in order to prevent burning, and allow it to shrink. The tread is then passed to a conveyer where it may be cut to length and booked or run into rolls with a heavy liner. Automatic scale equipment is occasionally employed in conjunction with the conveyer to determine the weight of the tread before cutting. The tread is next sent to the assembling department to be distributed to the tire builders.

Fabric

Cord fabric today is usually made of American karded peeler cotton, 13.3 ounces in weight, 2½ or 5½-pick, in some instances without any filling at all, thread count 3/3. There are three general methods used to impregnate the cord with rubber; gum dipping, latex dipping, and frictioning. In gum dipping the cord is passed through a bath of rubber cement in an enclosed impregnating machine, after which the solvent is evaporated, recovered, and the fabric wound up in a roll ready to be calender coated both sides so that the total gage will be approximately .052-inch. The latex process differs in that the cord is impregnated with rubber latex which gives the cloth a body or binder of rubber to hold it together for the coatings, no solvents or recovery process being used or necessary. Frictioning cord direct on the calender can be done successfully by experienced calender operators, but a great many factors have to be safeguarded. The roll must be wound at slow speed over a cell or can drier to get it thoroughly hot. Care must be taken to see that it is locked on the shell and wound evenly otherwise it will distort and cut the filling under tension. The friction compound must be completely warmed and consist of soft pliable rubbers. When the machine is thoroughly heated up and the compound worked so that a thin "pencil" bank is effected, the cloth is inserted in the calender and run through first on one side then on the other. There are calenders for doing both sides at once in operation in some of the big companies.

The fabric is then ready for the coatings after which it is



Tire Mold, Bag Mold, Core, and Bead Mold Specifications for a 29 by 4.40 Balloon Tire

wound in a treated process liner and goes to the bias shear for cutting into tire building strips.

Beads

The bead is a very essential part of the tire especially on the balloon type. The general method of bead making is as follows:

On a drum is laid a piece of 2.85 sheeting, 2½-inches wide, which has been frictioned on two sides and skim-coated on one, to a total gage of 0.035-inch. Five plies of standard, 17-strand, 21-gage braided wire, with the crevices filled with gum by running the wire through a tubing machine, are next placed on the wheel,

FABRIC

No. Plies	Fabric	Friction	Skim	Gage
4	K P	2 sides	2 sides	.057

Ply	Width, Inches	Length, Inches
1	13	68
2	13	69
3	12	70
4	14½	70

BEAD POCKET

Fabric	Friction	Skim	Width, Inches	Gage, Inches
Square Woven Peeler	Two Sides	One Side	4¾	.048

.130 GAGE BREAKER AND CUSHION

Fabric	Friction	Skim	Width, Inches	Length, Inches
Karded Leno	Two Sides	One Side	4½	75

COVER

Width, Inches	Length, Inches	Gage, Inches
14	102	.080

GUM INTERMEDIATE STRIP

Width, Inches	Gage, Inches
1¾	.075

Complete Specifications as Sent to Tire Foreman

Specifications for a 4.40 Straight-Side Cord Balloon Tire

taking great care to get the wire on with a strong and uniform tension.

The wire is next cut off and locked into place and a strip of gum is placed over the wire to give it a flexible top. The wire and filler are then enclosed by the sheeting and the bead rolled down firmly. The bead is then placed in the mold and cured, and on being removed is trimmed, buffed, and then dipped in a solution of cement. From this point it proceeds to the bead flipping machine where a strip of frictioned and coated chafing fabric is automatically rolled and stitched round the bead with the surplus fabric acting as a flap at the upper edge. This insures the correct placing of the bead in the tire and permits the bead to be joined to the carcass properly.

Mold

Knowing the materials to be used in the tire, it is possible to design the core, mold, and bull ring. The fabric should be figured to compress to .042-inch from .052-inch, a figure compiled from experimental data, using an air bag with an internal pressure of 150 pounds.

The width of the mold should allow as great a cross sectional area as possible, but not wide enough to cause the fabric, running from the top of the bead up towards the center of the tire, to have a double curve. This fabric should be as straight as possible to prevent rim cuts and fabric rupture above the bead.

The next distance determined is the inside diameter at the bead which is governed by the standard rim on which it fits. For a 29 by 4.40 tire, the dimension would be 20 by 64 inches or 3/64 greater than the diameter of the rim. Making the tolerance between the bead and the rim greater than 3/64 is dangerous on account of the liability of buckling of the bead wire, which when put under pressure will straighten out, causing the tire to leave the rim. The width of the tire at the bead should be 2$\frac{3}{16}$ inches, the same as the rim.

With the inside diameter known the next step is to determine the location of the center. This is done by laying out the cured tire around the bead with trim and construction, and taking a radius of 2.352 inches—a figure compiled by taking the thickness of four plies of compressed fabric, .248-inches and an .080-inch gage cover, from half the thickness of the mold, 2$\frac{5}{8}$ inches—and swinging it from the perpendicular center line of the mold until it forms a tangent to the fabric around the bead.

If preliminary layouts are made four-times size, this dimension can be measured accurately; otherwise it will have to be figured. As it is required to have the inside diameter of the tire a circle, this dimension can be obtained by adding 4.704 inches to the diameter of the center. The main dimension then left to be determined on the mold is the total height.

The tread of a tire is usually figured to wear approximately .04-inch for each thousand miles, and if the non-skid is designed so that voids are not over 20 per cent, the total thickness of rubber over the breaker will be 10 x .04 x 1.20 = .48. By adding together the thickness of the tread, .48-inch, 4 plies of fabric, .248-inch, and the thickness of the cushion breaker, .130-inch, the total thickness of the stock at the top of the tire will be .858-inch, and with this known, the height of the tire can be determined.

In the design of an air bag cord tire the tread must be continuous. In the larger section balloon tire sizes, a combination rib non-skid design is needed to facilitate steering and minimize vibration and irregular tread wear. At least fifty per cent of the contact area of the tread should be non-skid, however. The flat tread design is usually preferred for balloon tires over the round design.

With the foregoing data the mold can be readily laid out, care being taken to have the body heavy enough to withstand hydraulic pressure and to prevent springing when being machined, and made so that the male and female halves can be readily separated.

Core and Air Bag

As it is impossible to put cord fabric under tension in building, cores are designed so that they are 3 per cent smaller in circumference than that of the inside finished tire. This allows a peripheral expansion of stock of 3 per cent. As the fabric is locked around the bead, and the bead being of wire cannot change in circumference, the cords are put into tension when air is applied in the air bag.

Heavy rubber air bags, with no fabric save possibly at the valve patch and inside edge, are universally used. Most manufacturers make their own, and when properly designed, taken care of, and repaired, will last a hundred heats or more. As a rule, an air bag should be designed to stretch not more than 3 per cent. This allows for plenty of pressure in all parts of the tire, making allowances for gage deficiencies, and does away with the danger of the bag splitting during a heat due to too great distortion.

In designing the core there are really only two dimensions of importance, the width and outside diameter. The outside diameter is found by finding the circumference, which is 3 per cent less than that of the inside of the finished tire. The width in this case is 3.978 inches, a figure obtained by subtracting twice the thickness of the plies of green fabric, .208-inch, and .080-inch gage cover from the total width of the mold (4.40). The remaining dimensions on the core are determined by building equipment.

The core is made in four sections which are held in position by either a double ring fastened together through the sections of the core by bolts, or by means of a single tapered ring hammered into slots provided in the core.

Tire Making

Balloon cord tires may be machine built as regular cords, built flat by the drum method, or hand constructed. The cord pockets are first made up with two ply each, bias cut, and laid so that the threads cross at 45 degree angles. The following in the order

named are the operations in making a tire: (1) Cementing the core; (2) Apply first two plies, stitch down anl roll; (3) Trimming plies; (4) Placing beads with pockets by means of bead-setting rings; (5) Roll and stitch beads; (6) Apply third and fourth plies, stitch, roll, and trim; (7) Place filler and chafing strips, and turn chafing strips round the bead; (8) Apply breaker and intermediate strips; (9) Apply tread and sidewall, rolling down to remove blisters.

The tire and core are sent to the stripping table, where the core is removed and reassembled ready to be again cemented. The use of automatic chucks permits the tire to be removed from the core very quickly and easily. The tire is next dusted on the outside with soapstone, and the air bag, painted with a mica solution to prevent it from curing to the fabric, is inserted. After the bull rings have been placed on the tire it is put into the mold and placed in a cold press, which presses the halves together, enabling them to be fastened by means of wedges or tee-bolts.

A pressure of from 135 to 150 pounds is applied to the tires, which are then put into the vulcanizer to be cured. After the tires have been in the heater the required time, usually about an hour and a quarter, the vulcanizers are flooded, so as to give uniform cure, and the tires removed after the air bag has been deflated.

Inspection, cleaning, trimming, painting, flap insertion, and wrapping bring the tires to marketable condition.

Rubber Heels and Soles—a Marginal Industry

TAUSSIG describes the *margin of cultivation* as that stage in production where only the normal returns to labor and capital are secured. That a variance exists between the operating profits of the different kinds of rubber manufacturing is unquestioned. And if any one branch of the industry as a whole should be singled out as the typical marginal producer, undoubtedly the heel and sole division would be so designated. Even when rubber was at low levels, profitable operation of heel and sole units either as a part of larger interests or as independent enterprises was attained with difficulty.

One of the reasons for this condition was the comparative ease with which the manufacture of heels could be undertaken. As compared with tires or footwear, the machinery investment necessary was small, and the production difficulties, once the matter of compound was settled, not insurmountable for the average experienced rubber executive. But as most of these small heel undertakings were the fledglings of production rather than merchandising men, competition in selling was not conducted along straightforward lines. This fact, coupled with the tendency to overproduction, has made the rubber heel industry, both in good times and bad, essentially a marginal industry.

Taussig elucidates further in his economic discussion: "If an ill turn is encountered by such an industry, the first effect will be to cause the weak and struggling firms to disappear." Without doubt, the high rubber market has caused this to happen in the rubber heel industry in a small way, but rubber heel and sole manufacturing remains just as much a marginal industry today as it ever was notwithstanding, and if operated with business sagacity and judgment in both merchandising and manufacturing, it will produce a profit, not exorbitant in any sense of the word, but still a reasonable capital gain.

It has not proved difficult to produce a good quality heel without using rubber. Tube reclaim has come into use very widely, and as far as molding and wearing qualities go, has proved adequate. Many mills, however, have found it difficult to produce a heel compound with a tube reclaim base which would process as economically as the old crude rubber compounds. The trouble came in producing a sheet or ribbon of a specified gage which would run uniform enough to permit the most up-to-date cutting methods with their resulting low percentages of overflow. Chemists have found that a compound tube reclaim works much better than the grade made from floating tubes, aside from the price differential.

Heel manufacture is a matter of something more than compounds, however. After mixing, the first consideration is milling or calendering. The old fashioned method was to sheet stock on an uneven motion mill to an approximate gage, cut out the blank by die on a beam cutter, weigh to a sample, trim off the excess weight, and mold. Weighing cut biscuits proved slow and expensive so the next step was the lamination of stock off the calender, an extra operation in this department but cheaper than rehandling or weighing. Simultaneously with this development came the use of the tubing machine with a slicing attachment for cutting off biscuits to exact thickness. This was effective but too slow and expensive also. Finally a better and faster method of producing a heel blank was developed through various adaptations of the punch press which cuts heels from a ribbon about 3 inches wide at speeds from 4,000 to 8,000 pairs per hour. To avoid dual handling and approximate continuous production, it is now general practise to run the stock off an even motion mill in ribbon directly along a conveyer belt into the cutting machine, operating both as one unit. One man at the mill and another at the cutter can do the work that formerly required at least 20 men if all of the handling is included. Labor is commonly regarded as a minor factor in making heels but the above saving is vital to successful operation.

Waste in the form of overflow must be closely checked and given constant attention. There is the ideal condition, of course. Just enough stock to give proper compression and mold a perfect heel, free from blisters, with a thin hairline of overflow. No matter how closely cutting conditions are safeguarded certain variables from standards occur. A study of what causes light and heavy biscuits, and a determined effort to keep down the waste percentage, will produce results and pay dividends. In fact, the question of profit or loss may be determined by the overflow percentage alone.

The largest labor item is molding. Formerly it was general practise to run three molds with a fifteen minute cure, two in the press and one out. This allowed the pressman seven and a half minutes to change molds, clean, soap, insert washers, place biscuits, and close. Placing washers on the pins required more of this time than any other operation. Efforts to shorten it resulted in the development of several types of machines to put washers on the pins automatically. Their use allows the pressman to run four molds instead of three, three in and one out. By increasing the steam pressure slightly and shortening the cure to 14 minutes, this cuts the "out" time of each mold from 7½ to 3½ minutes. This increases production 33 per cent.

Five per cent for seconds is a liberal tolerance and as a general rule should average better than this. Heel seconds are either due to mechanical or chemical causes. Among the mechanical may be mentioned cutting by trimmers, failure to clean molds properly, light or heavy stock, and misplaced washers. Blisters and cracked "bosses" are chemical troubles, although the latter may be due to the failure of the pressman to open his molds when changing to

allow escape of gases. If the compounding ingredients undergo the usual testings and are safeguarded from moisture, if the reclaims are properly blended and run uniform, blisters in the stock should be kept at a minimum. In fact, upon the compounding skill of the chemist, a great deal depends in producing a heel economically. And the fact that crude rubber is 70 cents per pound should be no deterrent or alibi. With the assortment of reclaims now available a good workable compound can be produced at reasonable cost.

It is essential that provisions be made in the press room for the care and cleaning of molds. All reclaim compounds have a tendency to stick to the molds and constant brushing is required. After a mold has been in continuous use for some time a bath in caustic solution is general practise. Seconds, due to mechanical faults, are chargeable to neglect somewhere along the line and are reduced by applying pressure where needed.

Although with a machine capable operators can trim as high as 3,000 pairs per day, nevertheless, the trimming operation gives the impression of being the most inefficient method in present day heel manufacturing. Before long someone will invent a method of removing overflow automatically when the mold is opened. In fact, a duplex semi-automatic trimmer has recently been perfected.

The rubber sole of today is certainly no kin to the so-called fiber sole of three or four years ago. The 1926 product is a rubber product and needs nothing but its own good qualities to impart wear. Produced in three colors, black, tan, and white, it is finding wide favor among shoe manufacturers for use on children's play shoes, and work shoes of various types. As for its manufacture, it presents not so many problems as the heel, and is produced at a greater rate owing to the absence of washers. In fact, it should not be classed rightly as a marginal product as it enjoys a greater differential between cost and selling price.

The main problem with the sole as far as manufacturing goes, is to produce a blank with the ideal amount of overflow (about 3 per cent). Auxiliary machinery aside from calenders is being developed to produce a sheet of exact gage on every spot for the cutting of sole blanks. Sole trimming is necessarily slower than heels, and a new method for removing the overflow would find wide favor.

The new methods referred to in this article, are not in universal use as yet. Some companies have all of them, others only part. And many small rubber heel factories are still operating, slabbing the stock on a mill, dinking by die, and molding. The large mills have not ceased their efforts to improve the manufacturing methods of producing heels, and at the present moment are intensely interested in reducing costs.

LITHARGE FOR RUBBER WORK

Practically from the beginning of rubber compounding litharge has been used with sulphur to expedite the cure and increase the toughness of the product. Litharge, lime and magnesia were for many years the chief accelerators used in rubber working. Litharge displaced ordinary dry white lead many years ago, also sublimed and blue lead which are not as much used as formerly.

The introduction of organic accelerators and reenforcing pigments has lessened the rubber makers' use of litharge. However, the current annual requirements of the rubber trade for this material are estimated at 20,000,000 pounds. For rubber compounding it should be free from metallic particles and contain no copper which is particularly injurious to rubber.

For rubber work litharge should be practically free of red lead, and the total impurities should not exceed one per cent. The material should be very well pulverized to correspond with the average particle size of rubber pigments. Other specifications are not usual and variations in color running from lemon to orange are considered unimportant.

Wave-Type Rubber Ball Mill Linings

The success of rubber linings for ball mill grinding was demonstrated by the use of smooth slabs and sheets of rubber. Under actual operating conditions special quality rubber lining stock 1-inch thick gave equal or better wear than 2½-inch steel liner and, owing to the difference in weight, the mill capacity is increased without increasing the revolving load on the trunnion bearings. The reason for increased grinding capacity is that the balls resting directly on the rubber lining are pressed into its surface slightly by the weight of the mass above, thus reducing the slippage of the balls on the liner. This condition allows the balls to travel farther and faster on their upward movement, creating a more violent ball action on the downward path.

Experience with rubber linings for ball mill grinding ores, cement, etc., has led to the development by The B. F. Goodrich Co., Akron, Ohio, of different types of liner rubber of specially

Narrow Section of Completely Assembled Shell and Rubber Liner

tough and resilient composition. The wave type form is the result of this company's extensive development and experiments with rubber linings and incorporates the basic principle of rubber as an effective resister of abrasion, combined with mechanical features which solve the problem of attachment.

The illustration represents a narrow cross section of a ball mill shell with the wave type lining bolted in place. The lining is made of molded rubber in the form of a slab of standard section in widths ranging from 11 to 16 inches by 5 feet in length. The tough rubber face is cured to a semi-hard rubber base with a steel insert of special design to receive the bolt heads for attachment of the lining to the shell. When bolted in place from the outside of the shell the joints between the slabs are under slight compression, forming a water-tight union aided by previously cementing the edges of the slab.

STATISTICS PREPARED BY THE DEPARTMENT OF COMMERCE SHOW that during the three years of 1923, 1924, and 1925 the United States exported rubber belting to the amount of 3,548,468, 3,577,255, and 4,078,651 pounds respectively. The seven best customers for these goods during the three years indicated were: Mexico, the United Kingdom, Canada, Chile, Australia, Brazil, and British South Africa, Mexico holding the lead during the past two years. During 1923 British South Africa considerably outstripped other countries as a market for American rubber belting.

Rubber Prices and Profits

1925 Operations of the Big Five Analyzed—Stock Traders' and Politicians' Theories Refuted—Potential Earning Power Demonstrated Despite High Material Costs

"I CAN'T see much in the rubbers—simply because you can't pay a high price for raw material and make a good profit. It's all very well to talk about passing it along to the ultimate consumer, but there comes a time when that individual objects. . . . . When the rubbers are in position to make money I will buy them, but not just now, thank you." This quotation is from a financial journal of July, 1925.

Now that the returns for 1925 are available, they afford an excellent opportunity to compare fact with prediction. When the stock trader talks about "rubbers," he means the large companies whose shares are traded on the stock exchanges and therefore are of interest to the general public, in other words, the "Big Five."

United States, Goodyear, Goodrich, Firestone, and Fisk, in the order named, do the largest volume of business in dollars of all the rubber companies in the United States, and for the past seven years their combined sales have been more than half of the total rubber goods distribution of this country, hence the Big Five. Since the war they have marched along, without changing their relative positions, each having ups and downs at varying periods, but at this time they are all in the most healthy financial condition.

In 1925 these companies did a combined business of $712,681,748 with net profits, after payment of taxes and preferred dividends but before common dividends, of $70,027,379, which is 9.8 per cent profit on sales. Going back as far as 1919, in no year did the combined showing of these companies show as good a profit as this, the nearest being 9.4 per cent in 1919. In only one other year were the gross sales of these companies in excess of 1925, and that was in 1920 when the gross business was $752,350,340 but the profit was only 4.4 per cent due to the slump that started in that year.

Doubtless it was an approximation of these facts that members of Congress had in mind when they charged the rubber companies with "gouging" the public, using high rubber prices as an excuse for doing so. But they offered only a half-picture of the situation. What they should have said was that in the most prosperous year of 1925, the rubber manufacturers were able to show a profit despite the high price of rubber, not because of it, but by greater efficiency in manufacturing and distribution. Furthermore, that if it had not been for the abnormal raw material situation this profit might have been dispersed to the public in the form of dividends, whereas what actually happened was that much of it was set aside as a special raw material reserve on account of the rubber emergency.

In other words, if the rubber supply had been flexible enough to expand on short notice to meet the increased business enjoyed by the manufacturers last year, most of the rubber companies, large and small, would be paying dividends on their common stock today. As a matter of fact, of the Big Five, Goodyear, Goodrich, and Firestone now have their common stocks on a dividend basis while the United States and Fisk have not.

Of course, the per cent of profit on sales by no means tells the whole story. The rate of capital turnover is very important. If a company has outstanding capital, bonds, preferred and common stocks equal to a million dollars, and does an annual gross business of a million at a profit of ten per cent, its position is not as good as that of a company with outstanding capital of half a million, which does a million dollar business at a seven per cent net profit.

The United States Rubber Co., according to the latest figures, has outstanding capital stocks, bonds, and funded debt of $261,414,800. Returns for 1925 show sales of $206,473,737 on which a net profit of $17,309,870 was realized or 8.5 per cent. This is the largest per cent of profit on sales shown by this company in the last seven years although sales were higher in 1919 and 1920. The company never actually showed a loss in this period, however, the 1921 profit being .3. Considering the fact that this company does not turn its capital once a year, its showing for 1925 and during past years is indicative of skillful management.

The Goodyear Tire & Rubber Co.'s balance sheet totals $172,921,500 which includes the no-par common stock figured at market. In 1925 annual sales of the Akron company, exclusive of subsidiaries were $169,470,112 on which was earned a net profit of $21,005,898 or 12.4 per cent. Combined sales of foreign, Canadian and California companies were $205,999,820 which is very close to the United States Rubber Co.'s total. The figures of the Akron company only are used, however, as they form the basis for comparison with other years. Goodyear's dark hour was in 1920 and 1921; in 1920 a deficit of one per cent on sales was shown and sales for 1921 were only $82,195,550 (10 months) as against $188,866,024 for the previous year. Since then its position has steadily improved, although like its competitor, the United States Rubber Co., it does not turn its capital once a year.

The B. F. Goodrich Rubber Co. has outstanding capital of $108,083,500, including no-par common at market. Sales for 1925 were $136,239,526 on which a net profit of $12,744,447 was earned or 9.3 per cent. This is the highest sales volume since 1920 and the highest per cent profit since 1919 when 12.2 per cent was earned. The present showing of Goodrich is more remarkable in the light of the deficit of over $18,000,000 incurred in 1921. The fact that in 1925 the company turned its capital approximately 1⅓ times was doubtless instrumental in the resumption of dividends on the common stock.

Firestone Tire & Rubber Co. is distinctive among the Big Five in that the company has no funded debt, its entire capital being comprised of preferred and common stock which is $20,918,360 outstanding. Total business for 1925 was $125,598,000, largest in the company's history, and net profits were $12,800,412 or 10.1 per cent. This capital turnover at the rate of six times a year is indicative of a quick disposition of merchandise at a small unit profit; and the results of this policy are certainly reflected in the earnings of the company. In the last seven years, with the single exception of 1921 when no profit was shown, Firestone has never reported a profit of less than 8 per cent on sales; the high point was in 1922 when 11.4 per cent was earned.

Fisk Rubber Co., with outstanding capital now $40,040,463, improved its position materially in 1925 reporting sales of $74,900,373, nearly twice the business done in 1919 and 1920. Net profits were $6,166,752 or 8.1 per cent. A survey of seven year's operations of this company shows a profit in every year, but not at as high a rate as the other companies, probably due to the reflection of original equipment tire business in the aggregate earnings, and the fact that this company has no other product but tires.

As monopolies and their various ramifications seem to be occupying the public mind due to recent developments in the food and railroad field, it is pertinent to raise the question as to the trend in rubber. The fact that five distinct independent corporations do over half the rubber business in this country is not particularly alarming. But how does the Big Five stand today compared with

the last few years; is their share increasing or decreasing? The only figures which represent the entire industry are the following compiled by the United States Chamber of Commerce and they appear every two years, 1925 not yet being available.

	Total Value Rubber Products U. S. A.	Total Sales Big 5	Per Cent of Total
1919.....	$1,138,216,000	$659,884,264	58.
1921.....	704,903,133	439,231,471	62.
1923.....	953,643,355	521,826,114	52.5

According to the official figures then the Big Five are not retaining their share of the total business which they enjoyed in 1919 just after the war. This is further brought out by taking the 1925 Rubber Association figures of $1,142,096,000 supposed to represent 75 per cent of the industry. Changing this figure to a hundred per cent basis we find that the 1925 sales of the Big Five equal just about 50 per cent of the total.

Who is getting this increased share of business? Not the very small companies, many of which have gone to the wall in the last few years. But somewhere behind the five leaders, there is another group which might be dubbed the "Little Five" or more appropriately the little "eight" or even "ten." The word "little" is not very apt, either, as some of them have grown to be pretty lusty infants, each doing a business of anywhere from ten to fifty million annually; and they are very much respected as factors in the rubber trade. Kelly-Springfield, Miller, Hood, Ajax, Hewitt, Dunlop, Boston Woven Hose, General, and Lee are some of the names that come to mind. The recent absorption of Gutta Percha by Hewitt may suggest other possible mergers; but looking over the field at the moment, there seems small likelihood of it.

In fact in the whole range of industrial organization today there are few industries where competition is as free and open as in the rubber industry. Tire prices were promptly reduced when the crude market became stabilized and this reduction wiped out, in some cases two, in others three, previous advances. Tire prices are now lower than in 1923. Other lines of rubber goods where it is possible to maintain quality by employing reclaims have not had any phenomenal price advances.

The outstanding feature in the 1925 showing of the Big Five rubber companies is the fact that they demonstrated their potential earning power despite the high raw material cost which worried the stock trader and without "gouging the public" which seems to be of chief concern to some politicians.

ZINC OXIDE IN RUBBER WORK

While zinc oxide enters into the manufacture of many lines of products its chief consuming industries are paint and rubber to an equal amount with about 10 per cent for all other products. The use of zinc oxide in the rubber industry dates from the early production of mechanical goods and druggists' sundries. Until comparatively recently its use in rubber footwear was negligible on account of the dry heat cure being dependent on litharge. With the development of the tire industry its consumption reached large proportions because of its value in toughening the stocks and increasing their resistance to abrasive wear. It also improves aging quality and retards heat localization in tire tread service. The latter feature is of special value in the case of solid tires.

Nearly all organic accelerators require the presence of zinc oxide for their activation to produce their best results. High grade rubber insulation is reduced less in electrical resistance by the presence of zinc oxide than by any other pigment.

These are the chief qualities that mark zinc oxide as a standard and indispensable rubber compounding ingredient in essentially all branches of the rubber industry.

DURING THE PAST YEAR AMERICAN EXPORTS OF BATHING CAPS reached a value of $320,621, the chief customers for these goods being: The United Kingdom, $78,315; Denmark, $37,799; France, $32,949; Canada, $25,184, and New Zealand, $20,084.

Report on Rubber Price Control

The Committee on Interstate and Foreign Commerce filed its report March 13 with the House of Representatives. It sustains the contentions of Secretary of Commerce Herbert Hoover that foreign governmental controls were forcing the American people to pay exorbitant profits for rubber, coffee and other goods. After reporting their findings the committee set forth the following conclusions with special relation to rubber:

(1) It has been proved in the case of rubber that a conservation campaign can be conducted by the American people as a protest against high artificially controlled prices and with a fair degree of success. This experience is of considerable significance in showing the ability of the consumer to take matters into his own hands, and secure some measure of protection through exercising positive control over demand. As a result of this demonstration, the committee believes that a considerable measure of protection can be attained in this way for the American consumer.

If the American consumer should be further subjected to unfair prices, the committee believes that further and more extended efforts as to carrying on conservation campaigns should be systematically organized and carried out. If necessary the government should assist.

(2) The ultimate solution of the problem of foreign control of commodities essential to American industries and progress will unquestionably be for the United States to become more self-sufficient in their supply through endeavoring to produce these commodities for itself, either under its own flag or in suitable foreign countries which would agree not to interrupt free trading in them at any time. In effecting such agreements, the governmental facilities of the United States should freely assist.

(3) For growing rubber under the American flag the southern Philippines appear most suitable. Physical conditions are known to be excellent. Under the existing Philippine land laws the holdings of individuals or corporations are limited to about 2,500 acres. This condition could be altered by the Philippine Legislature or by the Congress of the United States if it chose to change that basic law under which the islands are now administered. Furthermore, certain experiments have recently been undertaken to develop the production of rubber from the guayule shrub in the southwesterr states. For several years rubber has been produced from this wild shrub in Mexico. In 1925 our exports of the rubber amounted to 8,469,123 pounds. The committee believes that these experiments contain such possibilities as to warrant serious attention and consideration.

Outside of American territory, good possibilities for successful rubber culture appear to exist in the Isthmus of Darien, in the Republic of Panama, Brazil, Colombia and other parts of tropical America. Plantations in such locations would be especially valuable to the United States from the standpoint of national defense, since rubber from them would most likely be uninterruptedly available in the event of war. Substantial progress is also being made in Liberia by American interests. As a step in the direction of assuring such supplies, the committee specifically recommends that the Department of Agriculture be authorized and enabled, in cooperation with their respective governments, to establish and maintain demonstration rubber plantations in South and Central American countries.

(4) Efforts of the Bureau of Standards and others to develop a synthetic rubber and other synthetic products should be further encouraged.

(8) Since these governmental controls are contrary to the interests of the American consumer, the committee takes the position that American citizens should refuse to aid or assist them by extending credit to them. Furthermore, self interest should prompt this action on the part of American financial interests for the granting of loans of this character would create a just resentment against them on the part of the American public. In some instances, requests for loans of this character have been refused. In at least one instance the loan has been granted. Requests for loans should be discouraged and if made should be refused.

(9) Retaliation by the United States against these governmental controls was not given serious attention by the committee and will not be except as a last resort.

(10) The committee has received suggestions that Congress give direct aid by representative American citizens of alternate supplies of these raw materials, but takes the position that aid or subsidy of this sort is inadvisable, partly because it is an intrusion of government into production, against the principle of which this investigation is directed.

Tubing Machine Rubber Products

The use of the well-known tubing or forcing machine for rubber manufacturing dates from 1876, when a crude machine comprising a cylinder containing a revolving screw was used to extrude plastic rubber mixing through a die.* By thus utilizing its plastic quality rubber can be shaped in continuous lengths in any desired tubular, solid or special cross-sectional form, according to the shape of the extruding die.

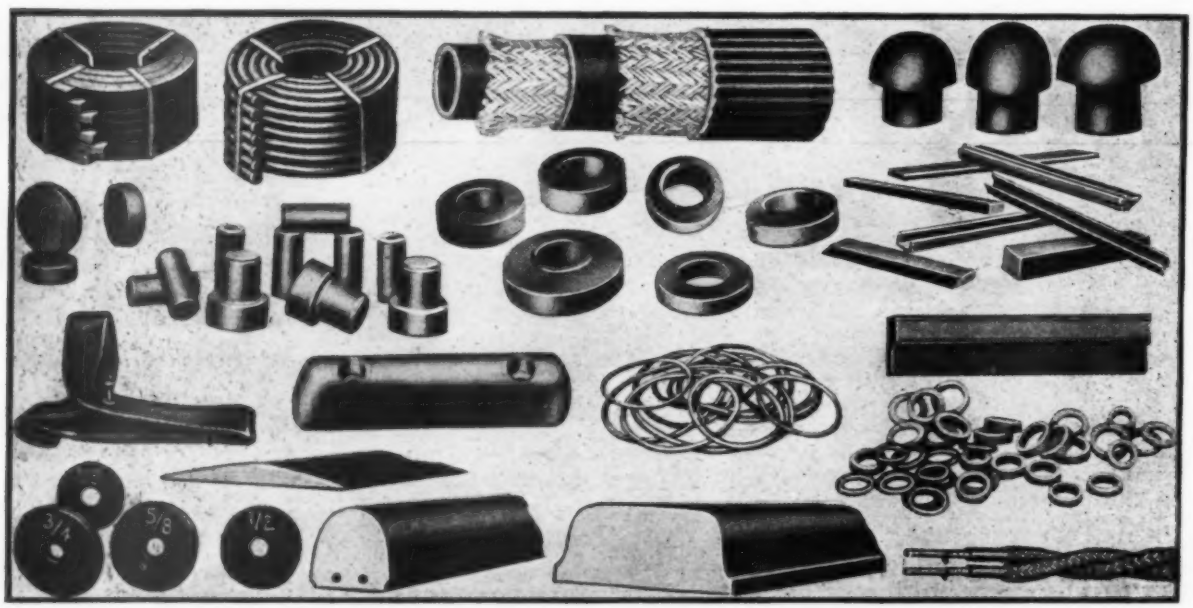
While the original tubing machines were of crude construction they were practical and were promptly adopted in hard rubber and mechanical goods factories. During the half century since its introduction the tubing machine has been greatly improved in design, construction and equipment. As now developed, in a wide range of sizes and power, it is adapted to turn out a great variety of rubber goods in the production of which a die can be used.

The modern tubing machine is one of the most convenient tools of the rubber worker. In fact, in the rubber factory, it occupies much the same relation to the other rubber machine equipment as a milling machine does in a machine shop, or the so-called "Variety" machine in a woodworking plant. One reason for this is the accuracy with which the tubed product can be controlled as to its dimensions and speed of delivery.

Special Features

Among the features that give the modern tubing machine its important place in rubber working are the facility with which the temperature of the rubber can be controlled by the circulation of steam or water in the walls of the body of the machine and in the internal water cooling of the forcing screw. The ability thus to regulate the heat and prevent scorching of the rubber is of special importance where sensitive and quick curing stocks are employed.

The introduction of the tapered pitch stock screw applies the forcing power with increasing intensity as it approaches the die, thus consolidating and expelling the stock more rapidly. The dies are usually kept hot by indirect heat from the steam chambered head or end section of the machine. Frequently, however, greater heat is required and is commonly supplied by a gas flame applied directly to the die itself. While this method gives good results, especially with small dies, in the case of large dies provision is sometimes made for heating them by a special electrical unit.



A Group of Rubber Products Representing the Diversified Output of Tubing Machines

In the layout of a tubing department attention is given to the selection of the size and arrangement of the machines, whether spur gear or direct connected to the power units, and whether the machines are to deliver their product straight ahead or at right angles, and to the facilities incidental to handling the product whether by intermittent or continuous production.

Utility of Tubing Machine

The tubing machine is virtually unsurpassed in economy of operation, conservation of stock in production, and in speed, accuracy and continuity of output. It thus facilitates the modern tendency to continuous production in such lines as insulation, continuous length small hose, jar rings, tire treads, inner tubes, etc. These advantages of operation presuppose the use of rubber mixings adapted to the conditions of machine production as well as to the technical conditions of service.

From the point of view of tubing machine operation the ideal stock is one that does not expand out of bounds when released from the die. This means a stock in which the plastic qualities of the ingredients are suitably balanced, and one that withstands tubing machine manipulation without scorching, by which is meant partial vulcanization.

Wire insulation, garden hose tubes, jar rings, etc., are good

*The India Rubber World, January 1, 1919, p. 191 and May 1, 1919, p. 432.

Typical Tubing Machine Products

Bibb disks.
Billard table cushions.
Blanks for molded articles.
Boot straps.
Bottle filler rubbers.
  Stoppers.
Bumpers.
  Automobile.
  Car seat, etc.
Catheters.
Connections.
  Automobile radiator.
  Gas stove.
  Plumbers.
Cord.
Cores.
  Clincher tire bead.
Druggists' sundries.
Eraser rubbers.
Faucet balls.
Fire hose linings.
Inner tubes.
Insulated wire.
Plugs.
Packing strips.
  Cores.
  Round.
  Square.
Pedal rubbers.
Pencil tips.
Pipe bits.
Platens.
  Adding machine.
  Typewriter.
Rings.
  Can sealing.
  Extractor.
  Fruit jar.
  Gage glass.
  Separator.
Rings—cut and molded.
  Round.
  Special.
  Square.
Rods.
  Hard rubber.
Sash rubbers.
Solid tires.
Stationers' elastic bands
Syringe pipes.
  Hard rubber.
Thread.
Tips.
Tires baby cab.
  Carriage.
  Cushion.
  Solid truck.
  Treads.
Tubing, for every purpose.
  Hose tubes.
Tubular gaskets.
Valves.
Washers.
  Cut.
  Molded.
Windshield rubber.
Wringer rolls.

examples of easy running stocks. As an extreme example of the possibilities of tubing machine output the delivery of insulated code wire at the rate of 800 feet per minute may be cited. Ordinarily, of course, speeds are much slower, depending on stock conditions, the volume of rubber required to form the article, and the shape of its cross section or profile.

The principal rubber products from tubing machines, in point of tonnage, are insulated wire, hose tubes, tire treads, inner tubes and ordinary tubing. These and a typical selection of other tubing machine products are pictured in the accompanying group illustration, which is by no means complete but serves to represent the diversified output and indicates the capabilities of the tubing process.

Another and important function of the tubing machine, when fitted with head and outlet of special design, is straining rubber mixings and reclaims through fine wire mesh for the removal of non-magnetic particles, wood, fiber and other mechanical impurities. Straining is a form of refining especially essential in the preparation of reclaimed rubber.

Aluminum Rubber Equipment

Strong Aluminum Alloy—Inner Tube Mandrels—Tire Building Cores—Mechanical Molds—Battery Box Molds and Cores

In the production of many of the staple lines of rubber goods, molds, forms, plates, rods, tubes and sheets of metal, are necessary to give shape, size and finish to the rubber article. Naturally steel and iron are the materials chiefly used for this portable equipment because of their strength and cheapness. Steel and iron, however, are not only very heavy but when used as rubber molds or mandrels their polished surfaces are marred by the incrustations of sulphur and other compounds that adhere to them. Although this effect can be remedied in part by the use of dopes to slick the metal surfaces, it cannot be entirely avoided. Thus frequent cleaning of the molds and mandrels is necessary and becomes a serious expense and inconvenience. In the case of steel poles, for inner tube making, the ends that extend beyond the rubber become corroded or pitted by the action of the steam and sulphur gases in the vulcanizer and are rapidly destroyed.

While iron and steel will probably always be used for hose and the larger and heavier molded articles, aluminum has been found to offer advantages in many forms of vulcanizing equipment. This is due to several of the characteristics of the metal, the principal ones being lightness, strength, durability, ease of machining and heat conductivity. The outstanding property of aluminum is its low specific gravity which is about one third of that of iron and steel. The ease of handling aluminum equipment thus reduces manufacturing cost.

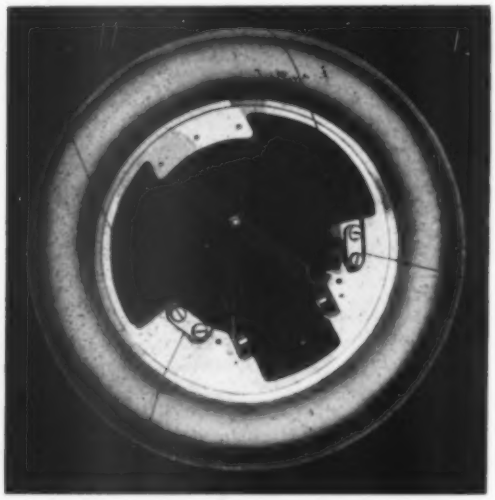
Strong and ductile alloys of aluminum are produced in which lightness is not sacrificed for strength, and which are as strong as mild steel. The fact that aluminum resists the action of corrosive influences and is not attacked by sulphur gives the metal special interest for the rubber industry. Aluminum does not withstand alkalis or strong salt solution. These conditions however are not frequently met with in the manufacture of rubber. It can, however, be used in contact with most organic acids, with some of the stronger mineral acids and is quite resistant to all ordinary atmospheric conditions. Aluminum alloys closely approximate pure aluminum in heat conductivity, permitting excellent heat transference.

So far as known, alloy aluminum is well suited for inner tube

Aluminum Alloy Inner Tube Mandrels

mandrels both straight and circular. The latter form is specially desirable for large size inner tubes to avoid buckling. The straight mandrel of 11 gage, 2⅛ outside diameter by 10 feet long, weighs about 25 pounds while the same mandrel of aluminum weighs about 9 pounds. An operator handling during the day 1,000 mandrels lifts 25,000 pounds if they are of steel, as compared

to 9,000 pounds if they are aluminum. The alloy aluminum mandrels produce a brilliant surface finish particularly noticeable on red tubes, and their surface remains clean a long time. When cleaning is necessary, it is easily and quickly done because there are no marks or pits to hold dirt. It is of interest to note that if it



Tire Core of Heat Treated Aluminum

becomes necessary to scrap aluminum mandrels they have a scrap value of about 25 per cent of their original cost.

When tires are built and cured on metal cores the matter of their weight becomes serious, even in the case of the smaller tire sizes. The introduction of balloon tires has so increased the sizes of these cores that it is not practical to handle them without air or mechanical lifts. During the preliminary stages of balloon tire development it was usual to purchase temporary wooden cores. These were short lived and ordinary cast aluminum cores

Gloss Applied to Rubber Flooring by Curing on Sheet Aluminum

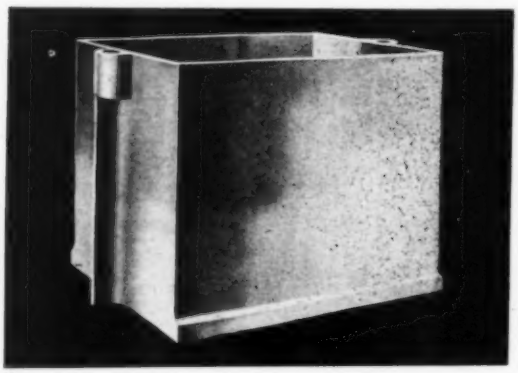
were too soft, consequently a special aluminum alloy was developed. This alloy exceeds cast iron in strength and almost equals it in hardness. As an example of saving in weight in this application, an aluminum alloy tire building core weighing 100 pounds replaces a cast iron core weighing 290 pounds.

Aluminum molds are usually made from forged slabs, rolled plates or castings from specially developed alloys. The metal is machined about three times as fast as steel or iron. While this is an important point the decisive factor in favor of aluminum molds is the lightness that reduces production costs.

One of the first applications of aluminum in the rubber industry was as boot trees to displace those of maple which require frequent replacement. Other articles made in aluminum molds are balls, bulbs, toys, mats, waterbottles, pedal pads, rubber flooring, etc.

Coiled sheet aluminum is widely used for making serial numbers, hose labels and brands for tires and other articles. The sheet when stamped takes a stamp impression of the die and imparts this to the rubber without sticking. Another use for sheet aluminum is to impart a highly finished surface on tiling, etc., by curing the goods on the sheet. Aluminum powder is used as an ingredient in the base stock of solid tires to increase the adhesion between the steel band and the base of the tire.

In the manufacture of hard rubber goods aluminum equipment is particularly useful in the form of curing tanks, trays and pans to replace those of steel or iron because they last many times longer. In hard rubber storage battery boxes, the entire mold and core is often made of aluminum alloy forgings. In other cases aluminum sheets, permanent mold castings or die castings are used. For small hard rubber articles such as radio equipment, fountain pens, etc., aluminum is used in the form of molds, tubes and mandrels because it is light, non-corroding and affords lustrous



Aluminum Die-Cast Battery Box Mold

finish. Many other advantageous applications of aluminum alloy will occur to the rubber manufacturer experienced in development work.

Legal Decisions

Customs Appraisers

No. 51041. Protest 106063—G of Bullocks (Los Angeles). The question here is whether rubber balls are dutiable as toys at 70 per cent ad valorem under paragraph 1414, tariff act of 1922, or at 30 per cent under paragraph 1402. Opinion by Sullivan, G. A. In accordance with stipulation of counsel the rubber balls in question were held dutiable under paragraph 1402.—*Treasury Decisions*, Volume 49, No. 6, page 52.

No. 51092.—Protest 85459—G of Carl Silvermann (Baltimore). Rubber balls classified as toys at 70 per cent ad valorem under paragraph 1414, tariff act of 1922, are claimed dutiable at 30 per cent under paragraph 1402. Opinion by Sullivan, G. A. In accordance with stipulation of counsel and on the authority of United States *v.* Stewart (13 Ct. Cust. Appls.—; T. D. 40734) the rubber balls in question were held dutiable at 30 per cent under paragraph 1402.—*Treasury Decisions*, Volume 49, No. 6, page 61.

ACCORDING TO *Commerce Reports*, AMERICAN EXPORTS DURING 1925 of rubber toys, balls and balloons, value $1,289,229, represented an increase of 31 per cent as compared with 1924.

What the Rubber Chemists Are Doing

The Absorption of Water by Rubber[1]

By C. R. Boggs and J. T. Blake[2]

CONTRARY to the general belief, rubber is not waterproof. Raw rubber will absorb water until it is completely dispersed and do this at room temperature, without the addition of extraneous material. This is in opposition to the old belief that rubber is a nonreversible colloid. Pratt's process of dispersion is only a special case of this principle in which the time is reduced by the addition of more protective colloids. Soft vulcanized rubber acts similarly at higher temperatures, but the disintegration is much slower. Certain samples of vulcanized rubber will absorb as much as 500 per cent water. Since most rubber articles are not immersed in water continuously for long periods, ths absorption is not realized by the rubber technologist.

Many failures of rubber articles are due to this water absorption. Soft rubber valves which are continuously under water become swollen and flabby and fail to operate. Electric wires insulated with vulcanized rubber lose their high insulation resistance and eventually fail, if allowed to soak continuously in water, either fresh or salt, without proper safeguards. Submarine cables have failed owing to water absorption alone. There is no evidence of deterioration due to oxidation, but the electrical failure of the rubber is positive and complete. Therefore, transoceanic cables have usually been made of gutta percha in spite of its many disadvantages.

The writers have studied the problem mainly from a physicochemical viewpoint and have concluded that the absorption is due chiefly to the nonrubber substances in the rubber and not to the hydrocarbon itself. Pure rubber absorbs only a very small amount of water. Prevention of this water absorption therefore lies in the purification of the commercial raw rubber. Vulcanized rubber shows the same relative characteristics as the rubber from which it is made.

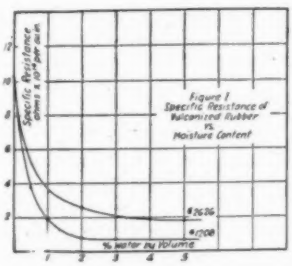


FIG. 1. SPECIFIC RESISTANCE VS. MOISTURE CONTENT.

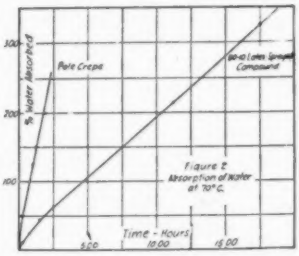


FIG. 2. ABSORPTION OF WATER AT 70 DEGREES C.

The electrical properties of vulcanized rubber are vitally affected by comparatively small amounts of water. To show the effect of absorbed water on electrical properties, the specific resistance-moisture curves of two typical insulating compounds are shown in Figure 1. The other electrical properties are also affected deleteriously. Today, very few high-tension submarine cables depend on rubber insulation if exposed to the action of water. Low-tension cables prove satisfactory because the insulation wall can conveniently be made thick enough to include a large factor of safety. A study of the rate of absorption of water by rubber is therefore of utmost importance in cable design.

An attempt was made to reduce the rate of absorption of water by means of suitable compounding ingredients. Nearly two hundred individual compounds were mixed and cured in this laboratory, and their rates of absorption determined. The compounding ingredients were systematically varied, both in amount and combination. The individual ingredients studied were paraffin, ozocerite, gas black, zinc oxide, barium sulphate, whiting, powdered ebonite, gutta percha, mineral rubber, glue, rosin, coumarone resin, phenolic resins, and fatty acids. The individual effect of 29 accelerators was also ascertained.

The effect of time of cure was ascertained. The rubber content of the compounds was varied from 10 per cent to 90 per cent. No remarkable improvement was effected.

The effect of coating the cured rubber with various waterproof waxes was studied. Rubber was also cured and impregnated in hot paraffin. Although this appreciably lowered the absorption of water, it did not give an entirely waterproof material.

The chloride, bromide, and hydrochloride of rubber and benzoyl and phenoxy rubber have been prepared in this laboratory. They proved to be unsatisfactory materials for resisting water when tested alone or mixed with rubber.

The rate of absorption of water by hard rubber was shown to be very much lower than that for soft cured rubber. The phenomenon of absorption seemed to be an inherent property of the rubber rather than a property of the fillers.

The swelling of vulcanized rubber by organic solvents takes place rapidly at first, and then less rapidly, finally coming to an equilibrium, where the absorption of solvent ceases. As the coefficient of vulcanization decreases, the swelling equilibrium increases. Eventually, as in the case of raw rubber, the swelling becomes a complete dispersion in the solvent. There is no sharp dividing line between the region of "solution" and swelling ending in equilibrium. This phenomenon is generally true of reversible colloids. Gelatin completely disperses in hot water, but in cold water swells to an equilibrium.

Andrews and Johnston[3] found that a sheet of cured rubber soaked in water at room temperature gives a curve of the die-away type, eventually reaching a condition of equilibrium with the water. Pale crêpe, when soaked in distilled water at 70 degrees C., does not show this phenomenon, but steadily absorbs water. At the end of a few days it becomes too sticky to weigh. If allowed to continue soaking, it disintegrates into a gluey mass and is practically dispersed in the water. Rubber is not an irreversible colloid, but redisperses by itself to give a latex-like material. It does not need an added protective colloid. Obviously, the temperature brings about other changes besides the dispersion.

At elevated temperatures vulcanized rubber exhibits an intermediate phenomenon (Figure 2). The sample of latex-sprayed rubber is associated with as much water as in the original latex. Although it still retains its general shape, it easily disintegrates in the fingers.

Summary

A vulcanized rubber compound is an absorbent of water, sometimes to the extent of 500 per cent. The water vitally affects its electrical properties.

Attempts to reduce the absorption materially by variations in the compounding have proved unsuccessful. The property of absorption is inherent in the rubber itself.

[1] Presented by J. T. Blake before the Division of Rubber Chemistry at the 69th Meeting of the American Chemical Society, Baltimore, Maryland, April 6 to 10, 1925. Condensed from *Industrial and Engineering Chemistry*, March, 1926.

[2] Simplex Wire & Cable Co., Boston, Massachusetts.

[3] *Journal of the American Chemical Society*, 46, 641 (1924).

There is no satisfactory mathematical interpretation of the rate of absorption. The absorption of water is somewhat similar to the swelling of rubber in organic solvents. The water is probably first absorbed in the surface layer, then slowly diffuses into the mass, followed by a more or less complete dispersion of the rubber.

The effect of a number of latex coagulants on the rate of absorption of the rubber produced has been determined. Factors in the absorption, such as pressure, temperature, surface tension, and the effect of air have been investigated. Temperature seems to play the most important part.

The absorption is largely due to the nonrubber-hydrocarbon constituents of the crude rubber. Purified rubber hydrocarbon absorbs a comparatively small amount of water. Methods of partially purifying the rubber by washing, by coagulating latex so as to lower the protein content, and by chemical means, were studied. It is believed that synthetic rubber has a much lower rate of absorption than natural rubber.

Measurements of Quality of Factice

By Kingsley Gillespie[1]

The following excerpts on the important topic of testing the quality of factice are of interest to rubber chemists generally.

The controlling factors in the quality of a factice can be resolved into a few groups, some of which can be evaluated and some of which are not susceptible of measurement. It is unfortunate, however, that the chief factor, namely the vegetable oil from which a factice is made, cannot always be determined from an examination of the finished product. The change which the vegetable oil undergoes during vulcanization so alters its chemical and physical characteristics as to hinder its identification. However, in the cases where the blending of two or more vegetable oils is not a factor, long experience with the many grades of factice enables the expert to estimate with some accuracy the vegetable oil from which a particular sample was made.

The compounding of vegetable oils with mineral oils leaves unmistakable earmarks in the finished product. The incorporation of gums or dry pigments can be readily determined by analysis. Also the relative quantities of the various raw materials used in the manufacture of a particular grade, and the degree of vulcanization of the vegetable oil used as a basis of this grade, can be fixed by analysis.

The commercial analysis of factice includes the following items: (1) color; (2) fineness; (3) mineral content; (4) solubility in acetone, free oil, free sulphur.

Color

The color of factice is applied only to the general class known as "whites." This determination is entirely relative and is made by a comparison with a set of standard samples. In forming an opinion of white factice from its color, consideration should be given to the mineral content as it has become possible to bring up the color of a particular grade by the use of a dry pigment. In the special case of a brown which consists of oil and sulphur only, the color of the product is used by the expert as a means of estimating the particular vegetable oil employed in its manufacture.

Fineness

The fineness of factice is an indefinite determination because of the nature of the material itself. Upon examination under the microscope it is sponge-like material of great surface area but relatively large particle size. It does not lend itself to screening and no more reliable means of determining the fineness of a sample has been found than comparing its particle size with that of a set of standard samples under the microscope.

The fineness of factice is not as important a factor in its rapid and uniform incorporation into a rubber compound as might be imagined. It has been demonstrated that the speed with which it "goes-in" on the mill is not proportional to its particle size. That its degree of fineness does not play an important part in rate of incorporation is made more clear when it is considered that the material is dissolved in the broken-down rubber on the mill and that the mill itself grinds the factice at the same time that it is dissolving it in the rubber.

Mineral Content

The mineral content of factice is found by an ash determination. A 2 gm. sample in a porcelain crucible is ignited over a free flame to constant weight. At first, disintegration takes place with evolution of dense smoke. Care should be exercised to avoid igniting the smoke to prevent a low determination.

The various grades of white will show 2.5 per cent to 50 per cent mineral content. A sample showing 2.5 per cent ash is referred to as a low-ash white, and carries the minimum amount of stabilizer necessary to insure the aging qualities for which factice is so well known. A sample having more than 2.5 per cent mineral content contains a pigment incorporated to obtain a desired result in a definite rubber compound, or in a limited number of cases simply as a cheapener.

The mineral content of brown factice should run under 0.5 per cent in all cases where oil and sulphur alone are used in its manufacture. An ash determination in excess of this amount means either the direct incorporation of a pigment or the use of some wax or gum in the compound. Such wax or gum may raise the ash determination because of its own residue on ignition.

Free Oil

The free oil and free sulphur are two determinations which are closely related in that together they total the portion soluble in acetone. The term "free" is doubly misleading because it conveys the impression that the oil is in its original state and that the sulphur is present as uncombined sulphur. The free oil in factice is that portion of the original oil which has been partially vulcanized but not to the point at which it ceases to be soluble in acetone. In the case of free sulphur the situation is more complex. With white factice the sulphur appearing in the acetone extract is most probably uncombined sulphur and has been introduced into the compound as sulphur dissolved in the vulcanizing agent, sulphur monochloride. In the case of brown factice, however, the free sulphur is made up of the sulphur combined with the partially vulcanized oil and the sulphur which is not combined at all.

There are two special cases of free oil which should be explained. Non-vulcanizable petroleum-base oil when used in the manufacture of white appears in the acetone extract and is considered as part of the free oil. Waxes, gums and greases when used in the manufacture of brown also appear in the extract and are considered part of the free oil. The petroleum-base oils remain unchanged but it is a question whether the gums are not partially transformed during the process of vulcanization.

The free oil of factice is obtained by subtracting the free sulphur from the total acetone extract. The free sulphur is generally a small fraction of the extract and subject to a relatively small error.

Free Sulphur

The free sulphur is obtained by oxidizing the acetone extract with fuming nitric acid and potassium chlorate, evaporating to 5 cc., taking up the residue in dilute hydrochloric acid and precipitating the sulphur as barium sulphate with dilute barium chloride solution. The determination is subject to the usual error

[1] The Stamford Rubber Supply Co., Stamford, Connecticut.

of a barium sulphate precipitation but when it is considered that the free sulphur of white should not exceed 0.5 per cent, and that of brown ranges from 1 to 8 per cent, it is evident that an error in the free sulphur determination has a small effect on the analysis as a whole.

Acetone Soluble in Factice

The author is led by the results of his exhaustive investigations on the various forms of apparatus in use for acetone extraction of factice, to assign preference to the syphon tube extractor recommended by the Joint Rubber Insulation Committee, January, 1914. The details of the author's method are as follows: 2 grams of sample are taken for both white or brown factice. The fineness of ordinary white factice is sufficient, except in the case of the white gum factice. For brown factice the sample should be as fine as consistency will permit in mechanical or mortar grinding.

The time of extraction for whites is 8 hours by 3 minute intervals between the syphoning of the solvent by the extractor. For browns the time of extraction continues 16 hours at 3 minute syphoning intervals.

Chemical Patents

The United States

CHLORINATED RUBBER COMPOSITION. A coating composition comprising chlorinated rubber and at least an equal amount of cumaron resin, and a solvent for these materials.—Norris Boehmer, Montclair, New Jersey, assignor to Chadeloid Chemical Co., a corporation of West Virginia. United States patent No. 1,572,065.

MENDING RUBBER ARTICLES. This process consists in heating the portion of the article to be repaired, and applying to it a compound obtained by a natural valence combination of turpentine and sulphur, and subjecting the repair to heat and pressure.—W. H. Buschell, assignor of one-quarter to J. D. Eastman both of Indianapolis, Indiana. United States patent No. 1,573,039.

PAINT AND VARNISH REMOVER. This consists of paint and varnish solvents and dissolved rubber, one of the solvents being oil of mirbane in proportion as high as 15 per cent.—Guido Blenio, assignor to Proofing Laboratories, Inc., both in New York, N. Y. United States patent No. 1,573,537.

AGE-RESISTING RUBBER COMPOUND. An alkali or alkaline earth salt of alpha-nitroso-beta-naphthol is added to a vulcanizable rubber compound to improve its aging properties.—Everett W. Fuller, Springfield, assignor to The Fisk Rubber Co., Chicopee Falls, both in Massachusetts. United States patent No. 1,573,928.

PROCESS OF PRODUCING RUBBER COMPOUNDS. Rubber mixed with sulphur and an accelerator, is calendered into a sheet of suitable thickness and an activator applied to the surface of the sheet which is then rolled upon itself and cured.—H. A. Morton, assignor to The Miller Rubber Co., both of Akron, Ohio. United States patent No. 1,574,676.

The Dominion of Canada

COATING COMPOSITION. This comprises latex, a pigment, and an agent for dispersing the pigment and for protecting the latex from premature coagulation until applied. The dried films of this composition are insoluble in water.—The Canadian Consolidated Rubber Co., Ltd., Montreal, assignee of William G. Nelson, Detroit, Michigan, U. S. A. Canadian patent No. 258,140.

BITUMINOUS COMPOSITION. The proces of making comprises subjecting a combined mass of rubberized fabric reduced to pieces, mineral matter and bituminous cement to a temperature sufficient to soften the rubber, then agitating the mass.—George C. Warren, Newton, Massachusetts, U. S. A. Canadian patent No. 258,163.

RUBBER DETERIORATION RETARDER. The process of making comprises combining an aliphatic aldehyde and an aromatic amine in a strongly acid solution.—The Canadian Consolidated Rubber Co., Ltd., Montreal, assignee of Sidney M. Cadwell, Leonia, New Jersey, U. S. A. Canadian patent No. 258,183.

TACKY RUBBER COMPOUND. Its formation comprises mixing with a water suspension of rubber an easily decomposable water soluble compound of a water insoluble ingredient for imparting tackiness, then decomposing the latter and removing that portion rendering it soluble.—The Canadian Consolidated Rubber Co., Ltd., Montreal, assignee of Merwyn C. Teague, Jackson Heights, Long Island, N. Y., U. S. A. Canadian patent No. 258,184.

PROCESS OF TREATING LATEX. The process comprises thickening and stabilizing the latex without coagulation by the addition of a coagulative thickening and stabilizing agent in the presence of a coagulation preventative.—The Canadian Consolidated Rubber Co., Ltd., Montreal, assignee of Merwyn C. Teague, Jackson Heights, Long Island, N. Y., U. S. A. Canadian patent No. 258,185.

THICKENING AND STABILIZING LATEX. The process comprises adding to latex a non-protein agent for thickening the continuous phase and stabilizing the latex without substantial modification of the colloidal condition of the rubber hydrocarbon.—The Canadian Consolidated Rubber Co., Ltd., Montreal, assignee of Merwyn C. Teague, Jackson Heights, Long Island, N. Y., U. S. A. Canadian patent No. 258,186.

RUBBER COMPOUND. That method of compounding unvulcanized rubber which consists in distributively incorporating rubber latex in a batch on a mill.—The Canadian Consolidated Rubber Co., Ltd., Montreal, assignee of Erwyn E. A. G. Meyer, Detroit, Michigan, U. S. A. Canadian patent No. 258,187.

METHOD OF USING RUBBER LATEX. A method of coagulating rubber emulsions in paper stock, which consists in dispersing the rubber emulsions in the aqueous medium containing the paper making fibers.—Judson A. De Cew, New York, N. Y., U. S. A. Canadian patent No. 258,281.

RUBBER COMPOSITIONS FOR LINING TUBES. The process of making consists in providing a mixture of melted rubber, vulcanizing cement and sulphur, heating the mixture for a period of time at a temperature above boiling point, then permitting the mixture to cool to a temperature below boiling point at which time a quantity of vulcanizing cement is added and thoroughly mixed to form the final lining composition.—John Schwab, Jr., Winnepeg, Manitoba. Canadian patent No. 258,340.

PROCESS OF VULCANIZATION. The production of vulcanized rubber which comprises the incorporation of the reaction product of an amine and an unsaturated aldehyde, and heating the resultant mixture with a vulcanizing agent to effect vulcanization.—The Rubber Service Laboratories Co., Akron, assignee of Clayton O. North, Tallmadge, and Chester W. Christensen, Akron, all in Ohio, U. S. A. Canadian patent No. 258,626.

The United Kingdom

WHEEL TIRES. A tire cover having no textile foundation is formed of rubber composition which after vulcanization possesses the combined qualities of high extensibility, high rigidity, and high tensile strength at rupture. A suitable composition consists of 100 parts by weight of crude rubber with 60 to 120 parts of carbon or lamp black. A small proportion of pine tar, toluol, or like emollient, and sulphur and litharge may be added. The tire may be formed by applying calendered sheets to a mandrel, or by extrusion through a shaped nozzle.—W. B. Wiegand, Kitchener, Ontario, Canada. British patent No. 243,819.

RUBBER VARNISHES. Raw or vulcanized rubber is dissolved in a high boiling point organic solvent, adding sufficient sulphur to produce a vulcanized rubber containing 15 to 32 per cent of sulphur. Accelerators may or may not be added. The mixture is heated to 160 to 170 degrees C. until vulcanized to the desired extent. The greater part of the solvent may subsequently be distilled off and replaced by another solvent. The solutions may be colored with dyes and pigments.—W. J. Mellersh, 28 Southampton Buildings, London. British patent No. 243,966.

WATER PAINTS. A suitable final composition consists of 16 pints of preserved latex of 25 per cent solid content; 14 pints of casein compound, and 32 pounds of pigmentary constituent.—Latex Developments, Ltd., 7 Great Winchester Street, London. British patent No. 244,150.

GUANIDINES. An accelerator of vulcanization is prepared by disulphurizing, diaryl-thioureas containing an alkylated amino group in each of the aryl residues.—British Dye-Stuffs Corporation, Ltd., 70 Spring Gardens, C. J. Cronshaw, and W. J. S. Naunton, Crumpsall Vale Chemical Works, Blackley, both in Manchester. British patent No. 244,159.

COMBINING SHEET MATERIAL. In cementing together plies of wood the surfaces are coated with rubber solution and the solvent allowed to evaporate. The second intermediate layer is impregnated with sulphur which vulcanizes the rubber to form a hard joint when the plies are subjected to pressure and moderate heat.—S. E. Saunders, Padmore, Whippingham, and J. Winfield, Cliffdene, Cambridge Road, East Cowes, both in Isle of Wight. British patent No. 244,606.

CONCENTRATING LATEX.* Rubber latex is concentrated by exposing a film on a rotary surface which dips into the latex, to a dehydrating medium, and returning the thickened latex to the bulk. A scraper is arranged in contact with the moving surface to ensure that the thickened latex is mixed with the bulk and to control the thickness of the newly formed film.—K. D. P. Ltd., 7 Gracechurch street, London. British patent No. 244,727.

BOOTS. A suitable composition is given as follows: Crude rubber 100, sulphur 5, litharge 5, carbon black 80, pine tar 4, and toluol 10 parts. The sulphur and litharge can be replaced by other vulcanizing agents, the pine tar by petroleum jelly or stearic acid, and toluol may be replaced by xylol or omitted altogether.—W. B. Wiegand, Kitchener, Ontario, Canada. British patent No. 244,848.

MOLDING RUBBER. A layer of material other than metal foil, such as textile fabric, paper, etc. is applied to the surface of rubber to be molded, to enable the article to be removed from the mold prior to vulcanizing.—O. Y. Imray, 30 Southampton Buildings, London. British patent No. 244,921.

INSULATING COMPOSITION. A composition suitable for use as a sealing-wax, insulating or impregnating composition. An example is given containing gutta percha, caoutchouc, copal resin and other ingredients.—F. H. Rogers, 181 Queen Victoria street, London. British patent No. 245,313.

JELUTONG. Jelutong latex, fresh or preserved, is evaporated to dryness to obtain a product containing all the solids of the latex. The evaporation may be carried out at ordinary or elevated temperatures either in bulk, films or spray.—Beech-Nut Packing Co., assignees of W. A. Beatty, 267 West 11th street both in New York, N. Y., U. S. A. British patent No. 245,405.

*Not yet accepted.

NO. 50 ACCELERATOR

No. 50 accelerator is one of the resin type accelerators, and comes as a dark brown powder packed in galvanized iron drums. Its adaptation is broad and covers high and low zinc stocks, tire treads, practically all qualities of mechanical rubber goods stocks and those containing reclaim in large amounts. It has the advantage of not scorching on the mill, does not adhere to the rolls and gives uniform results over a long range of cures, at low or high heats. It has the further advantages of being neither odorous nor poisonous.

New Machines and Appliances

Inner Tube Valve Base Drill

The neat motor driven tool here pictured is most effective for its purpose, that of quickly and neatly drilling a hole in an inner tube to receive the valve. In operation the end of the tube is slipped over the projecting arm. The hollow cutter is driven at high speed and descends by foot pressure cutting out both tube and valve base and leaving a clean hole of proper size. Valve holes can be cut 15 inches from the end of the tube and the machine can be operated in connection with a conveyer if desired. Water for lubrication is conducted to the cutter from a can supported above the machine. A stripper plate holds the tube down and there is an arrangement to push the small disk out of the hollow cutter after each operation. As the cut is completed the tool runs against end grain wood which avoids danger of splinters being left inside the tube. This tool is simple, durable and indispensable alike to manufacturers and to vulcanizing service stations. If provided with a collection of different sizes of cutters the machine will be found useful for many small hole-cutting jobs in rubber.—Utility Manufacturing Co., Cudahy, Wisconsin.

Utility Valve Base Drill

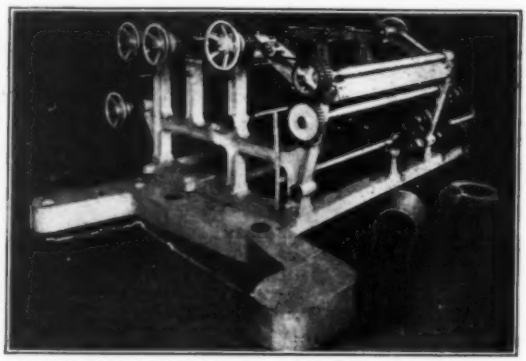
Double Lining Stripper

A redesigned and improved double lining stripper for use in connection with the Bolton vertical lining cutter is here pictured. The double stripper permits a continual operation of the bias cutter. It is so arranged that a roll of fabric can be hung in place for stripping while the machine is in operation, ready to follow the roll which is being cut. In this way the necessity is avoided of stopping the bias cutter for changing stock or removing linings and empty shells.

The stripper is strongly built to withstand severe strain. A 64-inch machine is driven by a 5 h.p. motor directly connected to a Reeves variable speed drive which is controlled with a friction clutch. All gears are cut to insure silent operation. Bronze bearings and bushings are used throughout. The machine is equipped with a reverse drive so that should a roll be partially used the lining can be wound back upon the roll by power where previously a hand crank was used.

The stripper will take a roll up to 45 inches in diameter and all rolls of stock and liners can be placed in or removed from the machine by means of an overhead hoist or trolley. For safety in operation guards covering the chain drives are in line with the top of the side frame of the stripper. This permits a clear view of the material from front, rear or either side.

The position of the stripper is in advance of the bias cutter and its function is to separate the liner from the frictioned fabric, rolling up the former on a shell while it allows the latter to pass freely to the bias cutter. The stripping effect is accomplished by two feed or pull rollers on the front of the machine. These are spaced about 14 inches apart from center to center, allowing the operator to easily pass the stock about the rolls.



Spadone Double Stripper for Bias Cutter

The double stripper is self-contained on a cast-iron bed plate and does not require a foundation. It occupies a space 6½ by 12½ feet and stands about 5 feet high.—Spadone Machine Co., Inc., 15 Park Row, New York City.

Steam Boiler Water Level Gage

A new type of instrument to show the water level in steam boilers is here illustrated. It may be installed at any convenient location where it may be easily read. It is capable of being used on any pressure from 5 to 1,200 pounds.

The instrument is operated by an electric current generated by a series of thermo-couples wound on a metal tube. The latter is a standard half-inch pipe of brass or steel, depending on the operating pressure, and is located within the standard water column. The thermo-couples are surrounded by a protecting case and from them a pair of asbestos covered wires lead to the indicating and recording instruments. When mounted in the water column the water inside the tube will stand at the same height as it does in the boiler. Above the water level the pipe is full of steam. The water in the pipe is in a quiet state and much cooler than the steam above. This difference is sometimes as much as 200 degrees. When the water stands high in the boiler this temperature difference is at a maximum and when the water is low in

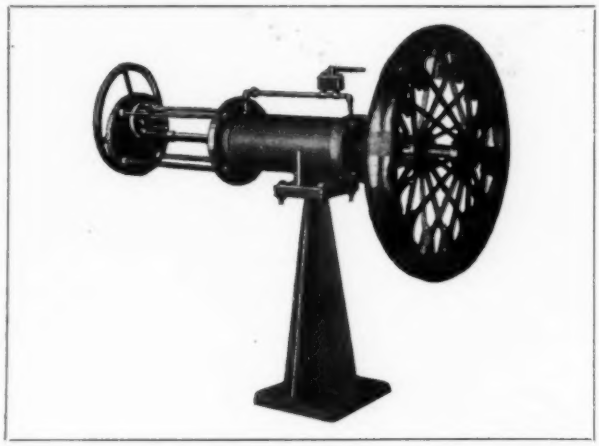
Bristol-Derr Water Level Gage

the boiler, the whole pipe is hot. As the water rises and falls the variation in temperature along the tube produces a varying electrical current corresponding to the changes in water level. These variations in the electrical current are measured by the instrument and indicated or recorded on the instrument in terms of water level.—The Bristol Co., Waterbury, Connecticut.

Flat Band Tire Expanding Machine

The well-established practice of building tires on flat surface drums and afterwards forming them to shape requires some form of expander. A new and improved machine for this purpose is here pictured. It is built to handle all sizes from 30 by 3 to 7.30 inches inclusive.

The cores are designed to fit any specific tire and are made in sections which are held by cam bars moving in slots in the arm



Akron Standard Tire Expander

core. The air cylinder for operating the stretcher is double acting working on 80 to 100 pounds pressure. A turret head in the rear is provided with a number of stop pins and is controlled by a self-locking hand wheel. The length of the stop pins can be varied and the one needed comes directly in line with the expander shaft.

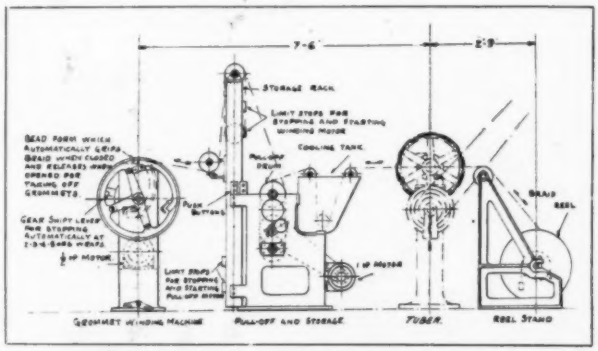
The advantage and saving of this machine is due to the fact that after the band has been stretched it requires only one man to place it on the core and eliminates one man from each tire machine. Where the band building method is used one band stretching machine will serve a number of tire building machines.—The Akron Standard Mold Co., Akron, Ohio.

Continuous Bead Making Machines

A bead forming machine especially adapted for the continuous production of tire beads is indicated at the left of the assembly shown in the diagram. The other machines of the group are a pull-off and storage machine, tuber and reel stand.

As operated for the continuous production of tire beads the flat braided steel bead core passes from the reel at the right through the die of the tuber for rubber insulation, thence through a cooling tank guided on rollers and from there around the motor driven drum of the pull-off machine to the storage rack. From this point it feeds to the continuous bead making machine which is operated by a half-horsepower motor.

The entire group of machines is under electrical control so that one operator is able to attend conveniently to all the operations incident to insulating the braided wire tape and winding the beads with any number of convolutions. The winding forms of the bead winder are fixed in diameter and provided with a quick gripping and releasing device, insuring beads of accurate diameters. The winding forms and convolution counter are quickly changed from one size of bead to another. The beads are wound at uniform tension, and an automatic stop attachment assures the same amount of wire tape for each bead and uniform lap without waste of tape.



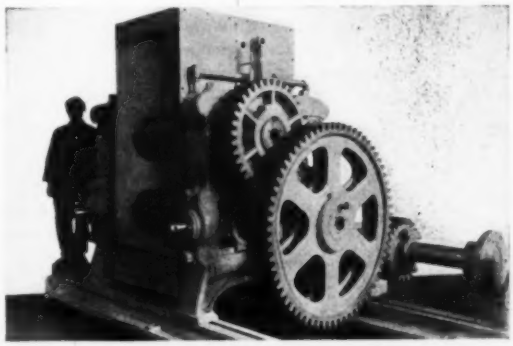
Banner Continuous Bead Making System

The feature of continuous production not only results in minimum cost but allows the speeding of the rate of output to as high as 6 beads per minute, depending upon the number of convolutions of wire. Since the beads are wound while the rubber insulation is fresh there results a high coefficient of friction between the wrappings, producing a bead which may be incorporated in the tire without preliminary curing.—The Banner Machine Co., Columbiana, Ohio.

Four-Roll Rubber Washer

The restricted supply and high price of crude rubber has stimulated the production of rubber from uncultivated sources and necessitated special care and facilities for washing these wild rubbers.

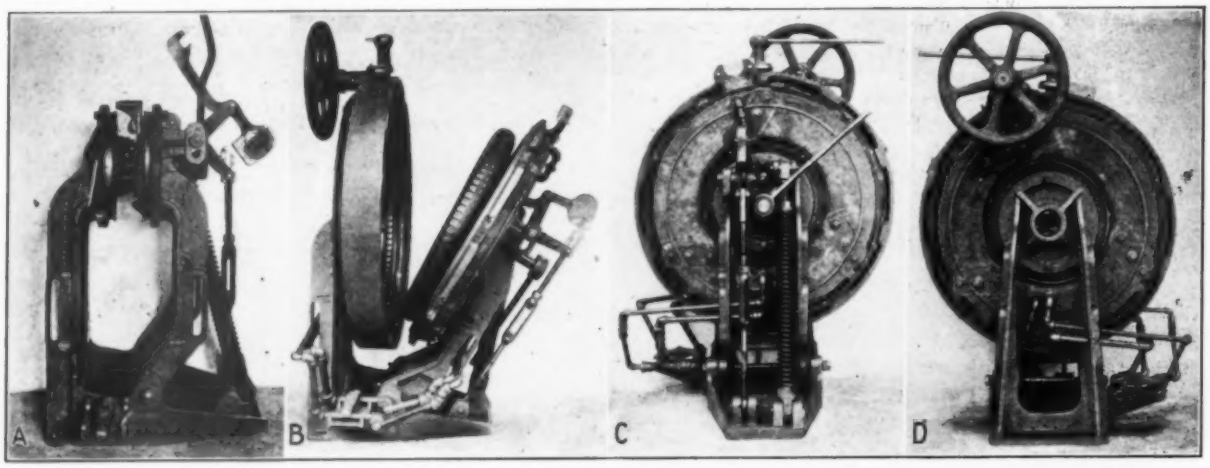
For handling all classes of rubber which require washing the four-roll washer here illustrated offers the latest development in this field. This machine operates on a new principle, namely, that the sheet of rubber as it passes between the upper and lower pairs of rolls is held under slight tension and the impurities are washed from it by sprays of water directed upon the tensioned sheet rather than while the rubber is held between the rolls as in the ordinary form of wash mill.



Young's Four-Roll Rubber Washer

This machine has met with a high degree of success in many leading American factories and seems destined to meet with favor abroad as well.—Farrel Foundry & Machine Co., Ansonia, Connecticut.

United States exports to the Philippines of tires and tubes have risen from a value for 1923 of $723,354 to $820,461 for 1924, and $1,006,217 for 1925.



A—CRADLE. B—SIDE VIEW OF UNIT OPEN. C—FRONT VIEW. D—REAR VIEW.

De Mattia Universal Cradle and Book-Type Tire Vulcanizer

Book-Type Mold and Universal Cradle

One of the latest developments in the popular book-type vulcanizers for tire work is here illustrated. Its special feature is the hinged universal cradle for holding and operating not only finishing molds for tires but those for air bags and inner tubes as well. The cradle, pictured at A is complete, including piping, tire ejecting device, locking ring, and opening and closing devices. It will receive any book-type mold up to 33 by 6¾ inches.

The molds are steam jacketed, and may be quickly mounted in the cradle. The time required to change molds in the cradle ranges from 10 to 20 minutes. A convenient plan is to mount a monorail over the cradle installations. It can be used not only for mold changes but for removing and inserting heavy tires as well. In changing molds in the cradle, the only points at which steam connections are broken are the unions in the supply and exhaust pipes.

The appearance and manner of opening the cradle and molds are clearly shown in illustrations B, C, and D. Picture B represents an open mold with tire stripped automatically ready for removal, while C and D show respectively the front and rear views of the mold unit with closing and locking devices. This unit is made not only in the vertical type illustrated but in horizontal type as well, which some manufacturers prefer for air bag and inner tube curing.—De Mattia Brothers, Inc., Garfield, New Jersey.

Machinery Patents

The United States

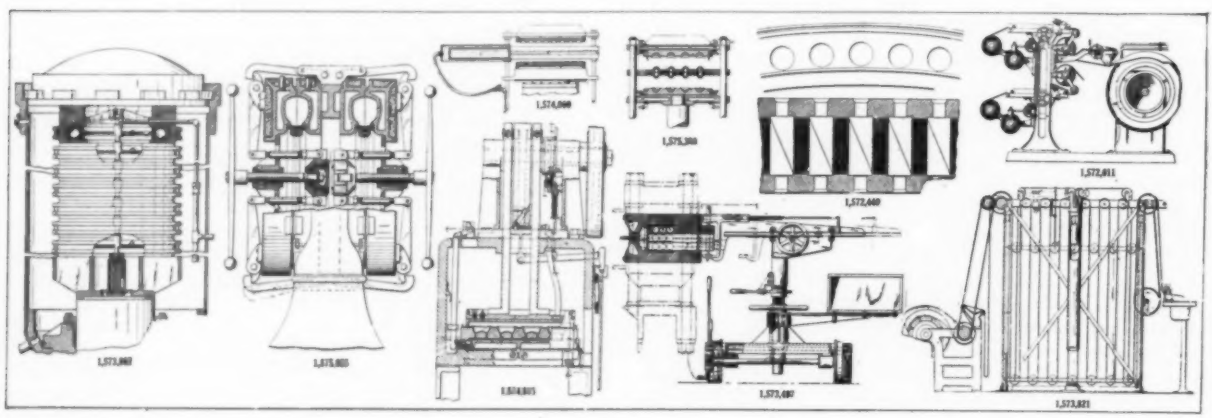
1,572,011. TIRE BUILDING MACHINE. This mechanism provides for passing strip tire building fabrics from stock rolls under a guide roller supported by arms or brackets in proximity to the collapsible tire building core. The guide roller is so supported that it may be swung out of the way of an attendant of the machine and locked in its active or inactive position.—Walter H. Hermann, assignor to Hermann Tire Building Machine Co., both of Lancaster, Ohio.

1,572,440. TIRE MOLD. This invention relates especially to making diagonal holes from side to side through cushion tires and may also be applied to cross hole tires. In a mold, with usual side plates and tread portion, the construction of the hole establishing pins is such that they may be easily withdrawn from the tire after vulcanization. This is accomplished by making the pins in two symmetrical halves, the plane of division between the two sections lying at an incline to the longitudinal axis of the pin as a whole and extending from one side plate to the other across the full width of the mold cavity.—Henry M. Lambert, Portland, Oregon, assignor to Lambert Tire & Rubber Co., Akron, Ohio.

1,573,497. APPARATUS FOR MAKING HOLLOW ARTICLES. This method produces even heating and vulcanization of all parts of a multiple-celled container, including its partition walls and facilitates removal of the article after vulcanization from the mandrel on which it is cured. Reference is made particularly to the production of molded battery jars.

Secured to the lower face of the upper fixed platen of a curing press is a mold member corresponding with a similar one on the top of the lower platen. These register to form a battery box around a pair of wedgable L shaped mold members each of which is adapted to press half of the bottom face and the adjacent vertical side faces of the jar. The wedgable parts are automatically withdrawn when the mold is open to permit removal of the jar and insertion of another. The mechanism for thus operating the mold is mounted on stand movable on a track passing in front of a battery of curing presses.—Edwin J. Kroeger, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y.

1,573,821. FESTOONING RACK. This machine is designed to produce a surplus of fabric at a tire making machine. It draws the material from the plying up table through a series of festooning rolls half of which are journaled at the top of the festooning frame while the other half are moved up and down together journaled on a floating frame. The rise



and fall of the latter is effected by cables attached to a vertically moving weight while the pull on the fabric comes from the tire building machine. This apparatus eliminates the use of a liner and delivers the tire fabric at uniform tension.—John R. Gammeter, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y.

1,573,862. VULCANIZING APPARATUS. A telescoped pipe structure is built up centrally through a stack of tire molds in the usual tire press vulcanizer forming a trunk conduit for steam with separate branch conduits for connection to the air bags of the individual molds in the stack. The telescoping sections of the conduit are united by gasket packed slip joints. The whole forms a simplified construction compared with the usual apparatus employed and requiring less care and accuracy in stacking the molds.—Nelson E. Raber, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y.

1,574,015. APPARATUS FOR FORMING HOLLOW ARTICLES. A rapidly operating mechanism is provided for pneumatically seating sheet stock in a mold and retaining it in seated position until the joining operation is completed. This is accomplished by providing a press into which a mold may be readily slid face upward, the press being equipped with a cover adapted to be quickly lowered over the mold and engage the plastic stock making an air-tight connection. Provision is made for admitting fluid under pressure into the cover which automatically seats the stock in the cavities. Closing a valve on the vents from the mold cavities then pneumatically retains the stock seated until the mold is released from the press.—Albert H. Bates, Cleveland Heights, Ohio, assignor to Paramount Rubber Consolidated, Little Falls, New Jersey.

1,574,060. MOLD FOR HOLLOW ARTICLES. Top and bottom mold plates containing numerous bowl shaped cavities and suitably held to the head of a press and its platen respectively. Each of the cavities is connected by venting passageways to the atmosphere. A sliding carrier of box-like form is arranged to carry on its top a sheet of stock bringing the latter directly beneath the top mold. A similar sheet of stock is laid by hand on the bottom mold. The carrier is hollow with open top and bottom. Communicating with it is a flexible pipe compressed air connection.

A box-like filler is located inside the carrier forming upper and lower pneumatic chambers of the intervening spaces. When sheet stock is compressed between the two sides of the carrier and the upper and lower molds, air is admitted through the flexible connection and the sheet stock is forced to place in the mold cavities. After thus seating the sheets the carrier and the molds are separated carrier slid out laterally and the press closed to seal the sheets into hollow form before their removal from the molds for subsequent curing.—Fred T. Roberts, Philadelphia, Pennsylvania, assignor to Paramount Rubber Consolidated, Tuckahoe, New York.

1,575,025. TIRE MOLD. An improvement in so-called watch case tire molds for more conveniently opening and closing them. The mechanism for securing the movable mold section against the stationary section is duplicated on each side of the watch case unit. It comprises a system of hooked levers, screw operated by hand wheels in the center of each side of the curing units.—Thomas H. Williams, assignor to The Akron Rubber Mold & Machine Co., Akron, Ohio.

1,575,388. APPARATUS FOR MAKING HOLLOW ARTICLES. This is particularly for making tennis balls with uniform thickness of walls. A pair of mold members with cavities is provided in conjunction with an intermediate heated mold member having oppositely facing protuberances complementary to the cavities. These are adapted to force the stock into the cavities, accurately forming it under pressure and slightly vulcanizing it to shape. The intermediate member is then removed and the stock overflow trimmed away. The mold members are then brought together after insertion of a chemical suitable to create internal pressure during the subsequent vulcanizing heat, and to maintain sufficient pressure throughout the life of the article. Thus the same mold members are used for forming, uniting and vulcanizing the articles.—Fred T. Roberts, Upper Montclair, New Jersey, assignor to Paramount Rubber Consolidated, Tuckahoe, N. Y.

1,573,305 Heater connection. Charles H. Desautels, Springfield, assignor to The Fisk Rubber Co., Chicopee Falls, both in Massachusetts.

1,573,365 Truck. Harley C. Wood, assignor to The Fisk Rubber Co., both of Chicopee Falls, Massachusetts.

1,573,386 Mandrel. Maletis Floyd Field, assignor to himself and Alphonso H. Marietta, both of Akron, Ohio.

1,573,390 Apparatus for making rubber coated weftless cord fabric. Albert Gessner, Jr., Morgantown, West Virginia.

1,573,577 Method and apparatus for making flush tank bulbs. Fred Thomas Roberts, Yonkers, assignor to Paramount Rubber Consolidated, Inc., Tuckahoe, both in New York.

1,573,775 Drying apparatus for sheet material. William G. O'Brien, assignor to The Goodyear Tire & Rubber Co., both of Akron, Ohio.

1,574,093 Tire core. Victor H. Hurt, Fort Madison, Iowa.

1,574,113 Apparatus for making hollow rubber articles. Fred Thomas Roberts, Yonkers, assignor to Paramount Rubber Consolidated, Inc., Tuckahoe, both in New York.

1,574,221 Device for swimming belt construction. John M. Welch, Houston, Texas.

1,574,542 Machine for forming and vulcanizing strip material containing rubber. Adrian O. Abbott, assignor to Morgan & Wright, both of Detroit, Michigan.

1,574,600 Core or mandrel. Ferdinand F. Brucker, assignor to The Miller Rubber Co., both of Akron, Ohio.

1,574,682 Machine for calendering and cutting sheets formed from plastic material. Ralph G. Null, assignor to G & J Tire Co., both of Indianapolis, Indiana.

1,574,683 Mold. Carl F. Ogren, Trenton, assignor to Thermoid Rubber Co., Hamilton Township, both in New Jersey.

1,575,421 Expansible core for use in vulcanizing tire casings and method of manufacturing same. Maximillian L. Engler, assignor to The General Tire & Rubber Co., both of Akron, Ohio.

1,575,434 Retreading and vulcanizing apparatus for tires. Albert Matthews, Victor St. Clair Malley and Henry William Rawley, Brighton, England.

Reissues

16,271 Method and apparatus for vulcanizing hollow articles. Abram E. Falor, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y. Filed January 11, 1926. Serial No. 80,681. Original No. 1,481,892, dated January 29, 1924. Serial No. 536,172, filed February 13, 1922.

The Dominion of Canada

258,179 Machine for finishing or truing up rubber rolls. The Canadian Consolidated Rubber Co., Ltd., Montreal, Quebec, assignee of William J. Kent, Brooklyn, New York, and Joseph M. Redinger, Providence, Rhode Island, both in U. S. A.

258,180 Tire building drum. The Canadian Consolidated Rubber Co., Ltd., Montreal, Quebec, assignee of Adrian Oren Abbott, Jr., Detroit, Mich, U. S. A.

258,188 Chuck. The Canadian Consolidated Rubber Co., Ltd., Montreal, Quebec, assignee of Jesse Butler McClain, Palmyra, New York, U. S. A.

258,257 Tire building machine. Karl Gustaf Alfred Backdahl, Djursholm, Sweden.

258,374 Method and apparatus for vulcanizing inner tube splices. The Firestone Tire & Rubber Co., of Canada, Ltd., Hamilton, Ontario, assignee of Horace D. Stevens, Akron, Ohio, U. S. A.

258,391 Vulcanizer. The Kuhlke Machine Co., assignee of Otto J. Kuhlke, both of Akron, Ohio, U. S. A.

258,596 Stapling machine. The Firestone Tire & Rubber Co. of Canada, Ltd., Hamilton, Ontario, assignee of William C. Stevens, Akron, Ohio, U. S. A.

The United Kingdom

244,619 Spray evaporators. P. C. Rushen, 28, Southampton Buildings, London (General Rubber Co., 1790 Broadway, New York, N. Y., U. S. A.).

244,904 Vulcanizer covers. H. H. Boyle, 81, Walters road, Swansea.

Germany

424,685 (February 16, 1924). Apparatus for kneading rubber. Dunlop Rubber Co., Limited, Birmingham, England. Represented by Dr. R. Wirth, C. Weihe, Dr. H. Weil, M. M. Wirth, Frankfurt a. M., T. R. Koehnhorn, and E. Noll, Berlin S. W. 11.

Process Patents

The United States

1,572,276 Splicing unvulcanized rubber tubes for tires, etc. Walter L. Fairchild, New York, N. Y.

1,573,271 Manufacturing golf balls. Albert Ernest Penfold, Birmingham, assignor to The Dunlop Rubber Co., Ltd., London, both in England.

1,573,391 Manufacturing cushion tires. John M. Hibner, assignor to Morgan & Wright, both of Detroit, Michigan.

1,573,576 Football. Fred Thomas Roberts, Upper Montclair, and William Eugene Roberts, Little Falls, assignors to Paramount Rubber Consolidated, Inc., Little Falls, both in New Jersey.

1,573,881 Resilient heel. William J. Tompkins, Mount Vernon, New York.

1,574,658 Hard rubber article. John F. Johnston, assignor to The Miller Rubber Co., both of Akron, Ohio.

1,574,896 Felt fabric. Reginald H. Johnson, Newark, New Jersey.

The Dominion of Canada

257,975 Making valve cup. Frank Wight, Springfield, Ohio, U. S. A.

258,181 Forming and applying rubber de igns. The Canadian Consolidated Rubber Co., Ltd., Montreal, Quebec, assignee of Thomas Victor Binmore, Long Island City, New York, N. Y., U. S. A.

258,244 Recovering fibrous tissues and rubber from old pneumatic tires. Raymond Marie, Colombes, Seine, France.

258,602 Manufacturing pneumatic tires. The Goodyear Tire & Rubber Co., assignee of Karl Bray Kilborn and William S. Wolfe, all of Akron, Ohio, U. S. A.

The United Kingdom

243,790 Solid tires. A. Maclennan, 28, Grafton Square, Clapham, London, and T. M. Down, 65, Gloucester road, Kew Gardens, Surrey.

244,252 Sole protectors. C. H. Hanwell, 38, Alexandra road, Northampton.

244,395* Dolls. K. Hergershausen, 64 Nassauische Strasse, Wilmersdorf, Berlin, Germany.

244,610 Connecting uppers to insoles and soles. W. L. Collinson, 4, College road, Great Crosby, near Liverpool.

244,655 Block paving. J. S. Patterson, 34, Clarges street, Piccadilly, London.

244,800* Boots. G. Cardile, 9 Via Melchior Gioia, Turin, and G. B. Laura, 9 Via Gioberti, San Remo, both in Italy.

244,847 Golf balls. G. W. Beldam, Boston Lodge, Ealing, London.

244,870 Packing rubber articles. A. Carpmael, 24, Southampton Buildings, London (Ajax Rubber Co., Inc., 218 West 57th street, New York, N. Y., U. S. A.).

245,177 Depositing rubber from latex on an anode. Anode Rubber Co., Ltd., 15, Throgmorton avenue, London (P. Klein and A. Szegvari, 78 V. Vilmos, Csaszar-ut, Budapest).

245,406* Packing heels. British United Shoe Machinery Co., Ltd., Union Works, Belgrave road, Leicester, assignee of G. O'Gorman, Boston, Massachusetts, U. S. A.

*Not yet accepted.

Germany

425,392 (April 7, 1923). Making of cushion tires. O. & W. Company, New York. Represented by Paul Müller, Berlin S. W. 11.

Rubber Chemist and Technologist

John M. Bierer, present chairman of the Rubber Division of the American Chemical Society, is held in high esteem by his associates no less for his genial personal qualities than for his pronounced success professionally, as evidenced by the value of his contributions to the advance of rubber technology.

John M. Bierer

Mr. Bierer is a Virginian, born at Cedarville in that state, March 3, 1888. He received his bachelor's degree at Washington and Lee University in 1908. Two years later he was also graduated at the Massachusetts Institute of Technology. Following his graduation in 1910 he remained a year at the Institute as an assistant in the chemical department. In 1911 he entered the employ of the Boston Woven Hose & Rubber Co., Cambridge, Massachusetts, for special chemical work and became chief chemist of that company in January, 1912. In 1916 he was advanced to the position of technical superintendent in charge of all of their laboratories, construction of goods, raw materials, manufacture of reclaimed rubber, compounding and of the mixing and calendering departments.

His success in handling the problems involved in this range of activities has been signalized by his invention of an air cure for fruit jar rings; the manufacture of the first crimson antimony produced in the United States; the origination and development of the oxygen bomb method for aging vulcanized rubber, and recent studies on the use of reclaimed rubber in the most economic manner. The solution of the latter problem is of special significance and value in view of the high prices prevailing for crude rubber and the impending need of its conservation.

In addition to his factory connection, Mr. Bierer is a member of the Specification Committee for Mechanical Rubber Goods of the Rubber Association of America, member of the American Society for Testing Materials, and chairman of the Rubber Division, American Chemical Society. He is also a 32nd degree Mason and a member of the Mystic Shrine.

ORGANIC RUBBER COLORS

The production of brilliantly colored rubber goods in many lines has been made possible by the use of accelerators permitting lower vulcanizing temperatures, and by the perfection of insoluble organic colors not affected by the action of sulphur and other compounding ingredients at vulcanizing temperatures.

Some artificial dyes which are not destroyed during heat vulcanization are quite useless in rubber work because they bloom on the surface of the goods, while many others are unsuitable for cold curing because sulphur monochloride reacts with them, either destroying the color or materially altering the shade.

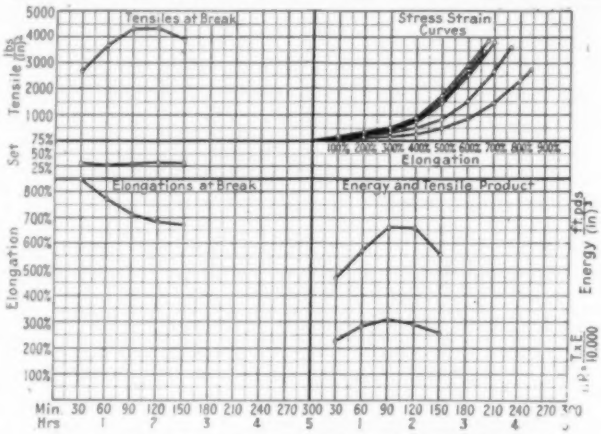
Twenty or more organic colors are now being used for rubber work and fill the varied needs of the many branches of the rubber industry. As an example, it is possible by the use of rubber orange to match the shades produced by antimony sulphides and iron oxides at distinctly lower costs. They are used in small percentages, usually less than one per cent, and produce uncommonly brilliant effects.

Another important feature of these organic colors is that they act as anti-oxidants, and compounds containing them have superior aging properties with less tendency to crack when exposed to the sunlight.

Organic colors for rubber have been used for many years in such goods as toy balloons and weatherproof coats where great brilliance and fastness to light are required and cost a minor factor. Since these very economical colors are available they seem destined to largely replace the older inorganic colors in rubber compounding.

Proposed Standard Chart for Physical Testing Graphs

A paper on physical testing graphs[1] was read by the well-known rubber chemist and technologist, W. B. Wiegand, at the meeting of the American Chemical Society, held April 3-7, 1922, in Birmingham, Alabama, in which the author presented a standardized form for exhibiting the results of the commoner physical tests on rubber. The design of this chart provides for the best arrangement of the data, and the suppression of non-significant variations. The chart actually measures 8½ by 11¼ inches, and the accompanying reduced illustration shows sample records



Graphs of Physical Tests on Wiegand Standard Chart

as they appear when plotted. The fine rulings have been omitted for clearness in this figure.

The advantages of this chart for recording control and research testing have been demonstrated by use in American and Canadian rubber works laboratories for the past 5 years. The results of the commoner tests are combined on this chart in a single picture, greater uniformity is secured in the representation of the results and comparisons are facilitated. These advantages appeal to all rubber technologists who look with favor on the adoption of the chart for general use.

[1] *The India Rubber World*, January, 1923, 224-225.

HOFFMANN-GOTTLOB ACCELERATOR PATENT SUIT

United States patent No. 1,149,580 issued August 10, 1915, to Fritz Hoffmann and Kurt Gottlob covering the manufacture and use of certain ammonium compounds as vulcanization accelerators, was purchased in December, 1918, from the Alien Property Custodian by the Grasselli Chemical Co. A suit to test the validity of this patent was brought by the Grasselli Company against the National Aniline Company, February 17, 1926, in the U. S. District Court, Southern District of New York, Hon. Augustus M. Hand, District Judge, presiding. Many chemical experts testified on each side before the trial closed March 5. It was then agreed between the attorneys that briefs be submitted to each other within 3 weeks for mutual answer and that arrangements would be made later for the arguments before the court on the briefs, after which decision rests with the judge. A complete report of the testimony can be obtained from Sidney C. Ormsby Co., 18 Vesey street, New York, N. Y.

The Editor's Book Table

Book Reviews

"MODERN DRYING MACHINERY." By H. B. Cronshaw. Published by Ernest Benn, Ltd., 8 Bouverie street, E.C. 4, London, England. Cloth, 159 pages 4¼ by 7 inches. Indexed. Illustrated.

THIS little treatise is a recent issue in the Chemical Engineering Library giving in outline the principles and practise of drying as applied in a wide range of industrial products. Those interested in the technology of materials involving drying will find the book informing and helpful. Of special interest to rubber technologists are the chapters treating of the drying of crude rubber and textiles. Also the vacuum system as applied to drying new and reclaimed rubber.

"CENTRIFUGAL DRYERS AND SEPARATORS." By Eustace A. Alliott. Published by Ernest Benn, Ltd., 8 Bouverie street, E.C. 4, London, England. Cloth, 151 pages, 4¼ by 7 inches. Indexed. Illustrated.

This volume of the Chemical Engineering Library discusses the construction and use of centrifugal machines from the mathematical point of view. The application of the centrifugal machine to the extraction of many products is given.

"THE MOULDY ROT DISEASE OF HEVEA BRASILIENSIS IN MALAYA." Bulletin No. 37. By F. W. South, M. A. and A. Sharples, A. R. C. S., D. I. C. Issued by the Department of Agriculture, Straits Settlements and Federated Malay States. Paper, 34 pages, illustrations, tables, maps. 6¼ by 9¾ inches.

The authors present the history and spread of the disease in Malaya, describe the symptoms and give details of the investigations on life history of casual fungus, treatment and prevention, methods of spread, conditions favoring the growth and spread of the fungus, etc.

"FOREIGN COMBINATIONS TO CONTROL PRICES OF RAW MATERIALS." Statements by Herbert Hoover, Secretary of Commerce, and other officers of the Department of Commerce. Published by the United States Department of Commerce, Washington, D. C. Paper, 34 pages, 6 by 9 inches.

In this publication the extent and character of "controls" over nine raw materials are reviewed, while more than half of the pamphlet is devoted to a consideration of conditions in the crude rubber industry. In a foreword Secretary Hoover states that in matters of such vast importance as to affect international relationships, it is necessary to get down to fundamentals, but without arousing national prejudices. He says further:

"It is this intrusion of governments into trading operations on a vast scale that raises a host of new dangers—the inevitable aftermath of any such efforts by political agencies to interfere with the normal processes of supply and demand. . . . The issue is much broader than the price of a particular commodity which may be at the moment vividly in the public mind; it involves the whole policy that our country shall pursue toward a comparatively new and growing menace in international commerce and relations." Recognizing the necessity for good will as the foundation of all world commerce, Secretary Hoover also believes that the time has arrived when the United States may well take stock of its present status and future prospects in raw material supplies and determine what policies it should adopt in national protection.

THE TOTAL VALUE DURING 1925 OF AMERICAN EXPORTS OF WATERPROOFED auto cloth and rubberized fabrics was $1,537,155, the chief markets being: Canada, $317,738; the United Kingdom, $270,897; Argentina, $176,242, and Australia, $137,146.

New Trade Publications

"THE BLACK ART OF RUBBER COMPOUNDING." CHAT NO. 11. This pamphlet of 16 pages issued by Binney & Smith Co., 41 East 42nd Street, New York, N. Y., discusses the pigment reenforcement of reclaimed rubber, giving the results in numerous graphs of the relative reenforcing power of micronex, zinc oxide and clay in tire and tube reclaims. The relation is shown between the stress-strain properties and the quality of abrasion resistance in reenforced reclaims, indicating their increased availability under suitable compounding for tire treads, wire work, heels and soles, matting and many other kinds of mechanical goods where resistance to abrasion is of principal consequence.

A LARGE COMBINATION CALENDAR AND CATALOG, ATTRACTIVELY printed in color, is being sent out by The Miner Rubber Co., Ltd., Granby, Quebec, Canada. The organization manufactures a very complete line of rubber footwear, as well as rubber surface clothing.

"RUBBER COLORS." THIS 8-PAGE BULLETIN OF POCKET NOTEbook size is issued by E. I. du Pont de Nemours & Co., Wilmington, Delaware. It contains much fundamental information on the principles of color and color matching, the influence of grade of rubber in darkening effect on colors, the effect of accelerators on colors, and colors for special purposes, all of which are of special interest to the compounder seeking color effects in rubber with organic colors, in the production of which the Du Pont company is a leading factor.

"METALLIC ZINC POWDER AS A PAINT PIGMENT." BY H. A. Nelson and W. A. McKim. This is a research bulletin issued by The New Jersey Zinc Co., 106 Front street, New York, N. Y.

As a rust inhibitive, zinc dust primer is at least equal to any other high grade commercial primer. Ordinary finish coat paints adhere to it and give the maximum service. It also makes a grey finish paint with a very high hiding power that completely covers any surface in one coat. It holds its color, does not crack upon exposure, and is particularly suited for painting industrial plants, steel structures and surfaces to which ordinary paints do not adhere well.

"CAMERON SLITTING AND ROLL WINDING MACHINES" UNDER this title the Cameron Machine Co., 61 Poplar street, Brooklyn, New York, issues an illustrated treatise of 50 pages, devoted to a detailed description of the Cameron score-cut slitting method and comparison of its advantages with a number of wasteful methods for producing strip materials. The wide application of the score-cut system is shown in the pages devoted to the models of machines designed for slitting many kinds of material including textiles, paper and metals. Special sections are devoted to details of accessories and incidental equipment applicable to the operation of the machines under manufacturing conditions. The book is authoritative in the field of modern methods of cutting and rewinding strip materials.

"UNITED STATES GOVERNMENT MASTER SPECIFICATION FOR Stitches, Seams, and Stitching." Circular No. 283, published by the Department of Commerce, Bureau of Standards, Washington, D. C. Paper, 52 pages, 7 by 10 inches. This specification officially promulgated by the Federal Specifications Board, March 1, 1926, covers stitches, seams, stitching, character of seams and guide to use of stitches in seams.

AMERICAN TIRE AND TUBE SHIPMENTS TO BELGIUM HAVE GROWN from a value in 1923 of $113,381 to $240,211 in 1924 and $515,168 in 1925.

Abstracts of Recent Articles

ORGANIC RUBBER ACCELERATORS.—A list identifying the various organic substances for acceleration of vulcanization which have been patented in the United States from their adoption to November, 1925. It is arranged numerically and chronologically, with the name of the inventor and the organic compound utilized.—Francis B. Leech, *Industrial and Engineering Chemistry*, March, 1926.

LIME IN THE MANUFACTURE OF RUBBER.—R. L. Fisher, *Rock Products*, 28, No. 18, 56-57 (1925).

ACTION OF NITROGEN TETRAOXIDE ON CAOUTCHOUC.—F. Emden, *Berichte der Deutschen Chemischen Gesellschaft*, 1925, 58, 2522-2527.

COMPARATIVE RESILIENCE OF LEATHER AND RUBBER HEELS. Measurements of the rebound of a weight dropped onto various samples of leather and rubber heels showed that only one make of rubber heels had a resilience comparable with that of oak-tanned leather.—J. A. Wilson, *Journal American Leather Chemists Association*, 1925, 20, 576-579.

THE EVOLUTION OF TIRE FABRIC.—A. E. Jury, *India-Rubber Journal*, March 6, 1926, 399-402. Reprinted from *Textile World*, New York. Illustrated.

EARLY HISTORY OF THE RUBBER INDUSTRY.—B. D. Porritt, *India-Rubber Journal*, March 6, 1926. Serial.

THE USE OF LATEX FOR THE TTEATMENT OF FISHING NETS.—Dr. J. Olie, *Bulletin Rubber Growers' Association*, February, 1926, 74-76.

CRÊPE RUBBER PREPARED WITH DIFFERENT REAGENTS.—H. P. Stevens, *Bulletin Rubber Growers' Association*, February, 1926, 77-79.

ON SULPHURIC ACID RUBBERS.—Dr. F. Kirchhof, *Kautschuk*, January, 1926, 1-4.

THE EFFECT OF GRAIN SIZE ON THE ACETONE EXTRACTION PERIOD.—Dr. St. Reiner, *Kautschuk*, January, 1926, 5-6. Table, graph.

PREGL'S MICROANALYTICAL DETERMINATION OF THE NITROGEN IN RUBBER. (DUMAS METHOD).—Hans Weller, *Gummi-Zeitung*, February 26, 1926, 1198-1199. Tables.

CONTRIBUTIONS TO THE TESTING OF THE ELASTICITY OF RUBBER, STEEL AND OTHER MATERIALS.—Lothar Hock, *Gummi-Zeitung*, January 29, 1925, 992 and *Zeitschrift f. techn. Physik*, 6, 50 (1925).

STUDIES ON HEVEA LATEX. IV. THE PROTEINS. V. THE POSSIBLE OCCURRENCE OF A COALESCING ENZYME.—W. N. C. Belgrave, *The Malayan Agricultural Journal*, December, 1925, 367-375.

NOTES ON CONTOUR PLANTING OF RUBBER.—F. Denham Till, *The Tropical Agriculturist*, October, 1925, 207-209. Illustrated, table.

THE SPECIFIC GRAVITY OF HEVEA LATEX. V.—Some further data on latex with low rubber content and a specific gravity greater than that of water.—Dr. O. de Vries, *Archief voor de Rubbercultuur*, January, 1926, 1-14. Tables. English translation 15-23.

EFFECT OF ACCELERATORS ON TEMPERATURE OF RUBBER MIXTURES.—F. Kirchhof, *Rubber Age* (N. Y.), February 25, 1926, 355-357.

NETHERLAND'S RUBBER IMPORTS AND EXPORTS

In 1925, the Netherlands imported 3,134 tons of crude rubber and 1,585 tons of waste and reclaimed rubber besides small quantities of balata and gutta percha. Of manufactures of rubber, tires and tubes head the list, imports of automobile tire covers amounting to 163,313, value 6,891,000 guilders; automobile tubes to 162,673, value 944,000 guilders; motorcycle tires 10,058, value 154,000 guilders; and tubes, 11,660 value 34,000 guilders; other tires 1,210,924, value 2,093,000 guilders; other tubes, 1,466,972, value 1,145,000; solid tires, 3,693, value 310,000 guilders. Footwear was another important item of imports, the totals being 1,611,387 pairs, value 1,545,000 guilders.

The exports included 4,841 automobile tire covers, value 161,000 guilders; 6,634 automobile tubes, value 26,000 guilders; 2,636 solid tires, value 593,000 guilders; and 745,645 other tires value 1,048,000 guilders.

Rubber Trade Inquiries

The inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The Editor is therefore glad to have those interested communicate with him.

NUMBER	INQUIRY
765	Firms exporting machinery for rubber trade.
766	American representative for firm manufacturing hydraulic presses.
767	Manufacturers of rubber bone for dogs.
768	Source of supply for rubber balloon six feet in diameter.
769	Formula and machinery for frictioning osnaburg white on one side only.
770	List of firms making top material for automobiles.
771	Manufacturers of cut sheet.
772	Source of supply of rubber coats and aprons.
773	Manufacturers to mold special rubber brushes.
774	Rubber (inflated) fat men's suits.
775	Manufacturers of rubber cement.
776	Air bag stripping machines.
777	Manufacturers of rubber sponges.
778	Mud guards for ladies' stockings.
779	Bladders for athletic goods.
780	Rubber spats.

Foreign Trade Opportunities

Address and information concerning the inquiries listed below will be supplied to our readers through The India Rubber World, 25 West 45th Street, New York, N. Y.

NUMBER	COUNTRY AND COMMODITY	PURCHASE OR AGENCY
19,200	Sweden—Automobile tires, boots and shoes, belting, hose and packing	Agency
19,203	Germany—Automobile tires	Agency
19,230	Mexico—Barber bibs, best quality rubber	Purchase
19,231	Iraq—Automobile tires	Agency
19,232	Mexico—Druggists' rubber sundries	Agency
19,236	Australia—Golf balls	Sole agency
19,239	Norway—Rubber floor tiling	Purchase
19,276	Czechoslovakia—Mechanical rubber goods	Agency
19,280	Latvia—Automobile tires (seconds)	Purchase
19,358	Luxemburg (Grand Duchy)—Rubber belting and packings	Purchase and agency
19,403	Peru—Druggists' rubber sundries	Agency
19,415	Bahamas—Rubber heels, nipples, fly swatters, dolls, and hard rubber cigarette holders	Purchase
19,456	Germany—Erasers and rubber bands	Purchase and agency
19,509	Germany—Fountain pens	Purchase
19,527	Mexico—Tube mills for treating guayule plant, and a rubber-drying outfit	Purchase
19,545	Egypt—Toy balloons, 10,000 gross	Purchase
19,546	Rumania—Rubber toilet articles, and medical and surgical apparatus	Purchase

Foreign Trade Circulars

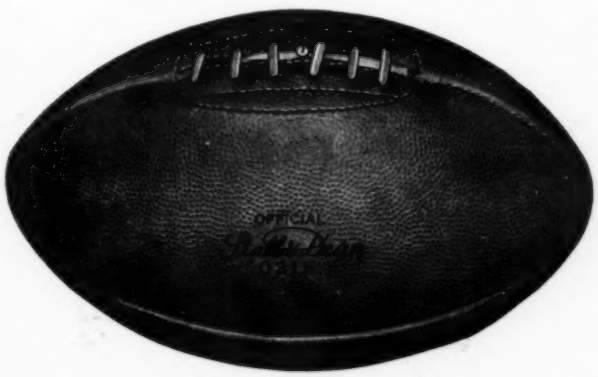
Special circulars containing foreign rubber trade information are now being published by the Rubber Division, Bureau of Foreign and Domestic Commerce, Washington, D. C. The publications which give details of the rubber industry in some one country are marked with an asterisk.

NUMBER	SPECIAL CIRCULAR
1093	"Tire Exporters' Weekly News Letter."
1095	"British Exports of Automobile Casings, 1925."
1098	"French Rubber Footwear Exports During Month of December, 1925."
1099	"French Tire Exports During December, 1925."
1100	"French Tire Exports During 1924 and 1925."
1101	"Tire Exporters' Weekly News Letter."
1103	"January Imports of Rubber Tires Into United States."
1104	"Mechanical Rubber Goods Exporters' Monthly News Letter."
1106	"Crude Rubber Reexports from United States, Month of January, 1926."
1108	"Tire Exporters' Weekly News Letter."
1109	"Market for Belting in Japan."
1110	"Canadian Tire Exports During January, 1926."
1112	"Tire Exporters' Weekly News Letter."
1113	"Rubber Footwear Exporters' Monthly News Letter."
1114	"Tire Exporters' Weekly News Letter."
1115	"German Exports of Automobile Tires and Tubes, 1925."
1116	"British Exports of Automobile Casings During Month of January, 1926."
1118	"Regulations for Classifications of Automobile Tires in Sweden."
1120	"French Tire Exports During Month of January, 1926."

New Goods and Specialties

Laceless Football

AN improvement in the inflated bladders used in footballs has been perfected by Stall & Dean, 2339 Logan Boulevard, Chicago, Illinois, and will appear on their new fall and winter lines. This improvement is in the form of a metal clasp which holds the stemless bladders in place, the clasp fitting on the flap of



Football with Stemless Bladder

the ball. If the bladder is punctured, another stemless or regular stem bladder may be substituted, thus combining the latest features of inflated ball construction and retaining many good points of the old type balls. These balls have been approved by many coaches of leading colleges to whom samples were sent for tests.

Heat Proof Inner Tube

Present high speed conditions have been responsible for the continued curing of tires when in use, this being particularly true of tires in bus and truck service. In the new True-Blue (heat proof) inner tube, The India Tire & Rubber Co., Akron, Ohio, claims the discovery of a heat resisting compound which makes the walls of the tube withstand the sustained heat which occurs inside the casing. In addition a new method of splicing is used, the spot where the tubes are joined having been always a weak place because of being double cured when put in service. By the development of the Sure-Vulc splice, there is a further resistance to heat and age.

Heavy Service Tire

The Heavy Service Royal Cord tire for trucks and hard wear in the passenger car service is the newest member in the tire line placed on the market by the United States Rubber Co., 1790 Broadway, New York, N. Y. The new tire is sturdy and impressive looking and is believed by the manufacturers to be the most satisfactory pneumatic tire for commercial purposes that the manufacturing department has ever turned out.

The ever increasing problems of commercial transportation necessitated revising the line of pneumatic tires, and it was thought advisable to eliminate the Truck-Bus tire and develop a tire especially designed for truck and heavy passenger duty, the Heavy Service tire being the result. This tire will be made in all the sizes formerly carried in the Truck-Bus tire, from four to eight inches in diameter. The new tire is larger in cross section, giving a decided increase in load-carrying capacity; it also has a wider and flatter tread than the Truck-Bus, showing an extension of the balloon principle.

The Heavy Service Royal Cord

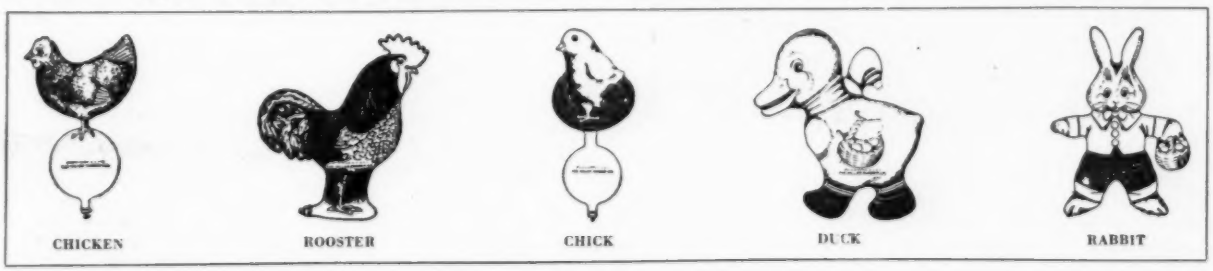
In the passenger car field, this tire will have a wide field of usefulness, as tires in this service are frequently abused, through over-loading, excessive speed and harsh road conditions. The new Heavy Service tire has been designed with an eye to presenting a good appearance on fine passenger cars as well as on trucks.

Rubber Non-Slipping Solution

As a preventative to rugs slipping a new substance, containing rubber in solution, has been evolved by The Rubber Growers' Association, 2 Idol Lane, Eastcheap, London, E.C. 3, England. This is in the form of a liquid which can be spread on the under surface of any mat, the solution when dry forming a thin film of rubber beneath the mat which grips the polished surface of the floor, whether parquet or linoleum, and so safeguards against slippage.

Easter Balloons

Easter, with its wide variety of eggs and rabbits and ducks, will find these toys a formidable rival of those made of candy. They are not, strictly speaking, inflated balloons, as they are made of heavy stock, designed to inflate only to the size of the character represented. The chicken and chick are equipped with squawker which operates when the lower part of the toy is squeezed, the rooster is weighted on the bottom so that it stands erect.—The Miller Rubber Co., Akron, Ohio.



Toy Balloons

All Rubber Gaiter

In small towns and cities where the snow piles up during the winter months these all rubber Alba closed quarter four-buckle gaiters are finding great favor. The gaiters are built up on an aluminum last, the inside lining first, then the outer sheet of rubber and finally the sole and heel are put on and the gaiter vulcanized. In order to release the gaiter from the last, after vulcanization, it is necessary to slit it down the front from the top to the throat thus providing ample room to pull it from the last, the style being equipped with regular bellows tongue, the same as on gaiters of the regular blucher pattern. — LaCrosse Rubber Mills Co., LaCrosse, Wisconsin.

Alba "Closed Quarter"

Office Chair Cushion

The appearance of the office is greatly improved and the comfort of the office workers enhanced by these "Rest Assured" cushions of sponge rubber. The felt top prevents clothes from wearing shiny, and an added feature is the name of the customer written across the top of the cushion. Rest Assured may be obtained with felt top of green or brown and has a 1½ inch bevel in front with a ⅛ inch shoulder on the side and back, which makes a better union between the felt and rubber. The cushions are ¾ of an inch thick, will retain their shape and will not pack.

Rest Assured Rubber Cushion

The manufacturers, The Oak Hill Rubber Co., Oak Hill, Ohio, have applied for a patent for the process of writing the customer's name on the cushion.

Rubberized Garden Umbrella

An improvement in the garden umbrella, recently announced by L. Stromeyer & Co., Kreuzlingen, Switzerland, makes it available for every occasion regardless of weather conditions. This new umbrella, called the Autex by its manufacturers, is covered with a rubberized double cloth, making it absolutely waterproof, able to withstand rain and storm. It is supplied in red, blue, green, yellow, gray and white, prettily embroidered, the colors being guaranteed fast, the sizes varying from about 2¼ to 3¾ yards.

Garden Umbrella

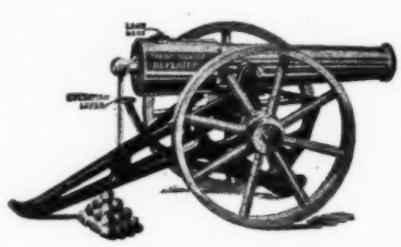
For restaurants there is a Giant-Autex measuring 5 to 6½ yards, which should prove a boon to public inns whose visitors to the gardens have hitherto been obliged to leave when showers arose, and who may now find refuge under these shelters.

Legging for Women

A new legging for women, designed to be worn with rubbers, has been invented by Ernest A. Gray, manager of the Capital City Corporation, Augusta, Maine. The "Legette" has an elastic front lacing with ornament buttoning at the side and is attractive and dressy. It is of leather, felt lined, and will be made in the popular spring shades to match the coats, and also in brocaded materials for evening wear, in shades to match the gowns and wraps.

Toy Repeating Cannon

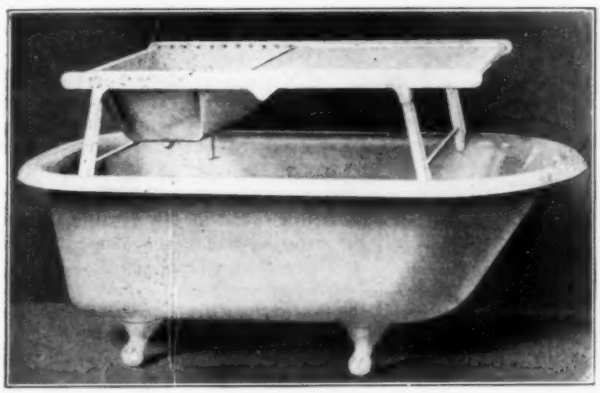
The Boy Ranger illustrated is an attractive repeating cannon which shoots twelve rubber balls without reloading, firing as rapidly as the lever can be worked. It is absolutely harmless, has remarkable accuracy and shoots twenty feet or more. The cannon is substantially built, the disk wheels enameled red and equipped with solid rubber tires. Included with each cannon is a set of six toy army soldiers and twelve rubber balls for ammunition. Ranger, Jr., is a single shot cannon which is furnished with three rubber balls and soldiers. —The Kilgore Manufacturing Co., Westerville, Ohio.



Boy Ranger

Baby's Rubber Bath Tub

In half the time it used to take to bathe baby the old fashioned way, he is washed and dressed with the aid of the Top-o-Tub. This combination bath tub and dressing table may be kept folded and hung on a hook in the bath room when not in use. It is a simple matter to lift (weighing as it does only 8 pounds), unfold and set on top of the tub, the curved bottom ends of the legs fitting over the edge of the big bath tub and holding it securely in place at a height that requires no stooping. Next a shower spray or length of rubber hose is attached to the faucet and in a few moments the tub is filled with water of the right temperature. The baby may be laid on the dressing table and undressed, then lifted into his tub with no fear of bumps, as the tub is made entirely of rubber. When the bath is over, the stopper is pulled out of the tub and the water runs out into the

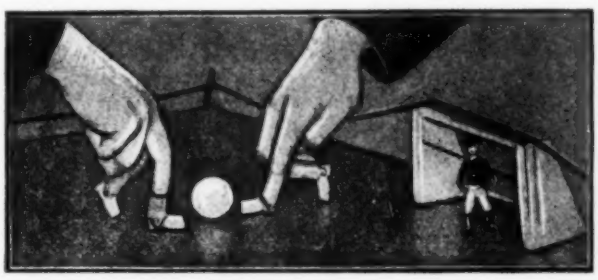


Top-o-Tub

big tub below, no fuss, no muss anywhere. Cleaning up means simply folding up the tub, rinsing clean under the faucet and hanging on the hook in readiness for next day.—Sturgis Manufacturing Co., Sturgis, Michigan.

Table Football Game

The game is played according to the ordinary rules of association football on any table, preferably one covered with a cloth. Each player is equipped with two wooden blocks shaped like boots which are attached to the first and second fingers by means of a short length of rubber tubing attached to the wood. The joint

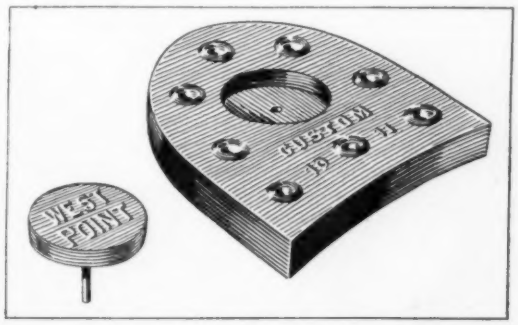


St. Frank's Football Game

between the boot and the rubber tubing acts in the same manner as an ankle joint. The game is supplied with goal posts, tapes with wire clips for preventing the ball from leaving the table and a miniature football.—The Chad Valley Manufacturing Co., Ltd., Harbourne, Birmingham, England.

Rubber Heel with Interchangeable Name

A well known maker of molds for the rubber trade has recently introduced a rubber heel mold which produces a heel with a circular cavity in the tread surface for the reception of a close fitting molded plug or disk bearing the name of the shoe manufacturer or his brand. The brand plugs are independently formed in a multiple cavity mold and each carries a molded in nail for attaching it when in place in the rubber heel to the leather heel above it. The flexibility of this device as an advertising feature

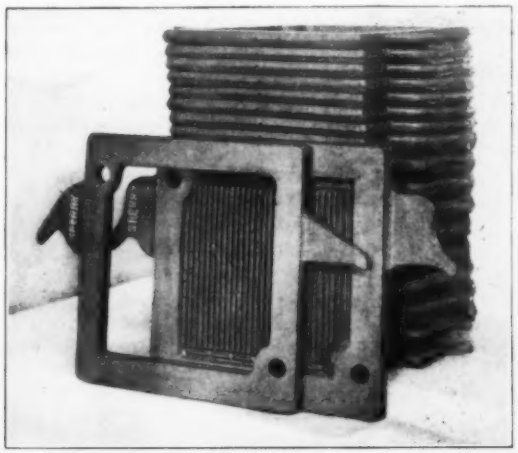


Molded Name Disk and Rubber Heels

is unlimited and should appeal to shoe manufacturers, retailers and repair men alike.—A. C. Hayden Co., Brockton, Massachusetts.

Hard Rubber Filter Press Plates

For filtering acid solutions which are not hot, filter plates and frames of solid hard rubber will be found highly desirable, the slight extra cost being more than offset by the greater satisfac-



Flush Plates and Frames

tion and longer life of the rubber. All surfaces that meet are machined which, combined with the slight resiliency of rubber, completely prevent leaks.

The plates and frames shown in the illustration were made to replace wooden plates and frames of a filter press through which passed a silver bearing liquor of great value. Due to leakage there was a loss of the liquor which the hard rubber plates have completely done away with. These flush plates are made with closed discharge, the frames being one inch thick.—D. R. Sperry Co., Batavia, near Chicago, Illinois.

The Obituary Record

Phil Madison Riley

PHIL MADISON RILEY, associate editor of *The India Rubber World* for ten years, passed away on February 21 at a sanitarium in Rutland, Massachusetts, after a long illness, although he had been active in literary work almost to the last. He had but recently returned from Florida, where he had gone in the hope of regaining his health.

Phil M. Riley

Mr. Riley was born in Belmont, New Hampshire, September 25, 1882, and graduated from Burdett College, Boston, in 1904. He married Caroline Maybelle Sanderson of Springfield, Massachusetts, December 24, 1910; was secretary and director of the Laconia (N. H.) Lumber Works, Inc., 1899-1904; taught in the public schools of Waltham, Massachusetts, 1904-5; was associate editor of *Photo-Era*, Boston, 1905-10 and 1913-16; architectural and photographic editor *Country Life in America*, 1910-13; associate editor *The India Rubber World* since 1916; Republican; Congregationalist; co-author of "The Woodcarver of Salem," 1916; "The Colonial Architecture of Salem," 1919; "The Colonial Architecture of Philadelphia," 1920; "Pneumatic Tires," 1922; and his articles on architecture, photography, rubber, etc., were sought by many high class magazines. His home was at 90 Manemet Road, Newton Center, Massachusetts.

Mr. Riley was not only a very graceful and voluminous writer, but was singularly attractive personally, possessing a frank, almost boyish manner, a keen wit, and an unfailing and genuine courtesy. He fought a brave battle against the fell white plague that finally terminated a brilliant and far too brief career.

He is survived by his wife, Mrs. Caroline M. Riley, and a daughter, Sylvia E. Riley.

A Sixty-Year Rubber Veteran

On January 4 Richard B. Meany died at the age of 74, passing away at his home in Union City, New Jersey, after an illness of only a few days. He had the unusual record of being connected with the rubber industry for sixty years, and since 1879 had been associated with the Peerless Rubber Co., now a subsidiary of the United States Rubber Co. Mr. Meany was one of the first five men employed by the Goodrich organization. He is survived by his widow and two married daughters.

General Sales Manager Detroit Insulated Wire Co.

After an illness of only a few hours, Charles C. Gray, general sales manager of the Detroit Insulated Wire Co., Detroit, Michigan, died at his home in Detroit on March 16, in his fifty-fourth year.

A native of Pittsburgh, Pennsylvania, Mr. Gray was for many years connected with the Westinghouse interests of that city, later becoming associated with the National Wire & Cable Co., also of Pittsburgh. In 1912 he began his duties as general sales manager of the Detroit Insulated Wire Co., an association which continued up to the time of his death. Mr. Gray was a man who was respected by all with whom he came in contact, and his untimely passing is deeply regretted by his many friends and associates, including also the organization with which he was connected.

Former Superintendent of Davol Rubber Co.

On December 27, 1925, Edward A. Ricketts, a former superintendent of the Davol Rubber Co., died at Reading, Massachusetts. Born March 27, 1844, in Bradford-on-Avon, England, he was educated in the schools of that town, his first business experience being gained in the rubber factory of Moulton & Sons, also in Bradford. Coming to the United States in 1869, he became connected with the Davidson Rubber Co., Boston, Massachusetts, while from 1883 to 1907 he was superintendent of the Davol Rubber Co., Providence, Rhode Island. Retiring from business for a few years, he then became associated with the Whitall-Tatum Co., Keyport, New Jersey, serving there in an advisory capacity from 1912 to 1915. Mr. Ricketts was an enthusiastic Mason, a 33rd degree Shriner. He is survived by one sister.

Edward A. Ricketts

Superintendent U. S. Rubber Reclaiming Co.

Charles B. Brewster, for the past three years plant superintendent of the U. S. Rubber Reclaiming Co., Buffalo, New York, died suddenly on March 10 at his home in that city at the age of 49 years.

Mr. Brewster was born October 23, 1877, in Derby, Connecticut, where he obtained his education in the public schools. After graduation from the high school he began his business career in the employ of A. H. & C. B. Alling of Derby, manufacturers of woolen underwear and hosiery. Ultimately he became manager of the concern and also had charge of its real estate interests.

In 1912 he entered the rubber business in the employ of the U. S. Rubber Reclaiming Co. of which his brother Frank H. Brewster had been engineer of construction and superintendent. For the past 14 years Charles Brewster was concerned with plant operation and management. He held the position of general superintendent from 1923 until his death. The duties of his position have now been resumed by his brother Frank.

Mr. Brewster was of a studious and retiring disposition and a devoted lover of books. He had no hobby other than business. He is survived by three brothers, Frank, Henry and John, the two latter being connected with the engineering department of the Birmingham Iron Foundry, Derby, Connecticut; and also by two young daughters, Marcia and Carol.

BRITISH EXPORTS OF AUTOMOBILE CASINGS—1925

British exports of automobile casings totaled during 1925 872,385, value £2,275,374, as compared with 550,263, value £1,379,083, for the year previous, an increase, according to the Department of Commerce, of 59 per cent over 1924. Similar figures for Canada showed a gain of 71 per cent, with United States tire exports 13 per cent greater, the latter country, however, shipping 380,000 more tires in 1925 than in 1924, and representing the greatest net increase in casing exports.

The three leading markets for British tires both in 1924 and 1925 were British India, the Irish Free State, and British South Africa, the number of tires imported in 1925 being for the three countries respectively: 102,860, 80,348, and 56,780.

News of the American Rubber Trade

Rubber Industry Outlook

GENERAL business seems to be held back somewhat by reason of the late spring. Normal seasonal orders are expected soon to relieve the hand-to-mouth and spotty conditions noticeable in many industrial lines.

Crude rubber consumption for the first quarter is distinctly less than for the same period a year ago. Thus spot stocks of crude have risen higher than was anticipated. This is due in part to moderate curtailment in tire production and to the increased use of reclaimed rubber. Doubts as to the practical value of reclaim as a partial substitute for crude in tire manufacture have been demonstrated by interchange of tests and experience between manufacturers and reclaimers, as well by the conclusions of qualified rubber technologists.

Motor vehicle production in February reached a total of 374,832, an advance of 15⅔ per cent over that for January and 25 per cent over the output in February, 1925. This rate of production indicates a corresponding growth in demand for tires and tubes. So also does the effort to broaden the used car market by making easier terms of payment to the used-car purchaser. Such an increase in the number of motorists will further enlarge the tire demand.

During the past month tire and tube production has proceeded at about 75 per cent of capacity in nearly all the large plants. Some small factories operated full and others on part time. The advent of warmer weather will doubtless stimulate buying by dealers and consumers and induce full time output by all. Tire consumption last year reached the estimated total of 54,600,000. This year's tire requirement is set at 60,000,000. This figure indicates the prompt resumption and continuance of full capacity output of all the tire plants for much of the remainder of the year.

The footwear division has been favored by general winter weather conditions which effectively cleaned out manufacturers' and dealers' stocks. Production of tennis, sport and other goods for summer wear is now proceeding at a good rate. In mechanical goods lines business is reported more or less spotty with outlook good for improvement very soon. Heel production is off 25 per cent mostly on original equipment because of the lateness in the season for leather shoes. The cut in price of code wire some weeks ago failed to increase its consumption. This miscalculation resulted in overproduction requiring correction by a brief cessation in manufacture. In this line of goods the scientific use of reclaim has led to markedly economizing crude rubber.

As a general summary it may be said that the rubber industry is operating now at about 85-90 per cent of capacity with the future bright for the rest of the year.

Financial

Dividends Declared

COMPANY	Stock	Rate	Payable	Stock of Record
Ætna Rubber Co.	Com.	$0.25 q.	Apr. 1	.....
Ætna Rubber Co.	Pfd.	$1.75 q.	Apr. 1	.....
Canadian Consolidated Rubber Co.	Pfd.	1¾% q.	Mar. 31	Mar. 24
Goodyear Textile Mills Co.	Pfd.	1¾% q.	.....	.....
Goodyear Tire & Rub. Co. of California	Pfd.	1¾% q.	Apr. 1	.....
Goodyear Tire & Rub. Co. of California	Pfd.	14% def.	Apr. 1	.....
Goodyear Tire & Rubber Co. of Canada	Pfd.	1¾% q.	Apr. 1	Mar. 15
India Tire & Rubber Co.	Com.	2% q.	Apr. 1	Mar. 20
India Tire & Rubber Co.	Pfd.	1¾% q.	Apr. 1	Mar. 20
Miller Rubber Co.	Com.	$0.50 q.	Apr. 25	Apr. 5
Norwalk Tire & Rubber Co.	Com.	$0.40 q.	Apr. 1	Mar. 15
Norwalk Tire & Rubber Co.	Pfd.	$1.75 q.	Apr. 1	Mar. 15
Overman Cushion Tire Co.	Com.	$1.50 q.	Apr. 1	Mar. 18
Overman Cushion Tire Co.	Pfd.	$1.75 q.	Apr. 1	Mar. 18
Overman Cushion Tire Co.	Pfd.	$1.75 q.	July 1	June 18

New York Stock Exchange Quotations

MARCH 22, 1926

	High	Low	Last
Ajax Rubber, com.	11½	11	11¼
Fisk Rubber, com.	17¾	17¼	17¾
Fisk Rubber, 1st pfd. stpd. (7)	82¼	82	82¾
Goodrich, B. F., Co., com. (4)	63¼	62⅛	62½
Goodyear Tire & Rubber pfd. (7)	105	104	104½
Goodyear Tire & Rubber pr. pfd. (8)	106¼	106	106¼
Kelly-Springfield Tire, com.	16¾	16¾	16¾
Keystone Tire & Rubber, com.	1¾	1⅝	1¾
Lee Rubber & Tire, com.	11⅜	11¼	11¾
Miller Rubber, com. (2)	38½	38½	38½
United States Rubber, com.	71¼	69⅛	70⅝
United States Rubber, 1st pfd. (8)	106	106	106

Akron Rubber Stock Quotations

Quotations of March 19, supplied by Otis & Co., Cleveland, Ohio.

COMPANY	Last Sale	Bid	Asked
Aetna com.	20¼	20	21
Aetna pfd.	..	88¼	100
Falls com.	10	..	10
Falls pfd.	18⅞	..	18⅞
Faultless com.	40	28	40
Firestone com.	110½	110¾	117
Firestone 1st pfd.	103	102	103
Firestone 2nd pfd.	98¾	98½	98¾
General com.	180	..	175
General pfd.	108	106½	..
Goodrich com.	69	..	..
Goodrich pfd.	99¼	..	..
Goodyear com. V. T. C.	35½	35	..
Goodyear pfd. V. T. C.	102¼	..	..
Goodyear pr. pfd. V. T. C.	104¼	..	..
India com.	155	148	155
Miller com.	44	..	..
Miller pfd.	102¼	102¼	103
Mohawk com.	65	..	45
Mohawk pfd.	80	..	80
Seiberling com.	25	24	24¾
Seiberling pfd.	95	95	95¾
Star com.	15	12½	15
Star pfd.	35	..	..
Swinehart com.	9	9	..

United States Rubber Co.

Sales of the United States Rubber Co., 1790 Broadway, New York, N. Y., for the year ended December 31, 1925, were $206,473,737, an increase of $34,259,384 compared with 1924. Net income from operations, before interest on the funded indebtedness, but after all other charges, including depreciation of plants, was $25,038,305. Interest on funded indebtedness was $6,228,435, leaving net income of $18,809,870 for the year. Federal taxes for the year were estimated at $1,500,000, for which reserve was made, thus leaving net income of $17,309,870 after federal taxes and all other charges. This does not include any income from rubber plantations owned by the company. Dividends on the preferred stock were $5,227,518, leaving surplus for the year of $12,082,352.

Because of fluctuations in the crude rubber market, $3,000,000 was appropriated out of surplus earnings for 1925, and to be applied against the cost of crude rubber received during 1926.

The consolidated surplus as of December 31, 1925, was $41,061,686. Current assets as of December 31, 1925, were $154,129,757, and current liabilities $29,426,757. The company retired $958,000 of funded indebtedness during the year, through the operation of the sinking funds, being $774,000 of 5 per cent bonds and $184,000 of 7½ per cent notes.

Inventories of finished goods were valued at cost of production, which in all cases was substantially below the cost of replacement at the market prices for raw materials. As stated in previous reports, there was some uncertainty as to the value of inventories at foreign branches, which were being investigated. This investigation has been definitely completed, and sound values determined, and the resulting loss in value of these inventories, amounting to $2,007,242, has been charged against corporate surplus, as being definitely allocated to prior periods.

Inventories of raw materials and supplies were valued at cost prices, which were materially below market prices. Contractual liabilities, representing forward commitments for raw materials and supplies, including crude rubber, were at prices substantially below market, and as to quantities covered future requirements for conservative periods.

The operations of rubber plantations owned by the United States Rubber Co. produced substantial profits for the year, after providing adequate reserves for depreciation of plant and equipment and amortization of the cost of development, and for foreign income taxes. No part of the profits or of the accumulated surplus of the plantations companies has been included in the earnings or surplus of the company.

Rubber received from the plantations is taken into account by the company at current market prices, and the plantation companies are credited in open account. The plantation companies draw against this open account for current cash requirements, and the balance not required for operating and development purposes is retained by the company and is comprised in its general assets. The balance of the open account amounted to $7,338,305.19 as of December 31, 1925.

The United States Rubber Co. closed the year in a strong financial condition, as indicated by the balance sheet, and as to inventories of finished goods and raw materials, including forward commitments, is in a favorable position.

New Incorporations

AIRLOX RUBBER CO., INC., December 28, 1925 (Delaware), capital $200,000. Incorporators: D. K. Carpenter, Chicago, Illinois; P. F. Daniels and Frank C. Hughes, both of Evanston, Illinois. Principal office, with the Corporation Guarantee and Trust Co., 927 Market street, Wilmington, Delaware. To manufacture, buy, sell and deal in all kinds of automobile accessories and in particular valve caps for tire tubes.

BOWMAN-CURB TIRE CO., INC., February 10, 1926 (New York), capital 100 shares no par value. Incorporators: M. E. Patterson, G. R. Schumann, and M. L. Friedman, all of River Road, Buffalo, New York. Principal office, Manhattan, New York. To manufacture auto tires, etc.

CROWN TIRE CORPORATION, March 17, 1926 (New York), capital $20,000. Incorporators: Isidore Ginsberg, L. W. Brackman and Daniel Hogan, all of 132 Nassau street, New York City. Principal office, Manhattan, New York. To manufacture tires.

DEL RUBBER CORPORATION, March 5, 1926 (New York), capital $50,000. Incorporators: Del Nobert, president, 425 West 147th street; David Burke, vice-president, 33-35th street, Brooklyn; George G. Chase, secretary and treasurer, 311 West 23rd street; all of New York City. Principal office, 49 West 64th street, New York, N. Y. To sell rubber tires and tubes.

EASY PAY TIRE CO., January 29, 1926 (West Virginia), capital $25,000. Incorporators and officers: M. E. Thackston, president; J. A. Thackston, Jr., vice-president; Lawrence Schavul, treasurer; H. M. Burke, secretary, and Mrs. Pauline Thackston; all of Huntington, West Virginia. Principal office, 613 Tenth street, Huntington, West Virginia. To retail tires and tubes.

GOLF BALL DIE CO., January 26, 1926 (Michigan), capital $50,000. Incorporators and officers: C. A. Notman, president; W. A. Aubin, vice-president and treasurer; Harry L. Pierson, secretary; and Henry Fysh, all of Detroit, Michigan. Principal office, 5680 Twelfth street, Detroit, Michigan. To manufacture golf ball covers, dies, and paint, and recover and repair outfits.

GOODMORE TIRE CO., March 8, 1926 (New York), capital $50,000. Incorporators and directors: John J. Goodland, Minnie Goodland and Sherman H. Pooley. Officers: John J. Goodland, president, 25 Augustine street; Sherman H. Pooley, secretary and treasurer, 29 Probert street; all of Rochester, New York. Principal office, 563 Main street, Rochester, New York. To handle Firestone Tire & Rubber Co. products 100 per cent.

THE MASSILLON TIRE & REPAIR CO., January 23, 1926 (Ohio), capital $12,000, 120 shares value $100 par, all issued. Incorporators and officers: W. E. Shaeffer, president; G. S. Shaeffer, vice-president; O. E. Baad, Jonas Shilling, and L. E. Lytle, secretary and treasurer. Principal office, 11 East Oak street, Massillon, Ohio. To buy, sell, repair and exchange pneumatic and solid rubber tires, automobile accessories, etc.

L. J. MUTTY CO., INC., January 8, 1926 (Massachusetts), capital 500 shares, no par value. Incorporators and officers: J. B. Mutty, president; V. H. Mutty, vice-president and treasurer. Principal office, 175 Congress street, Boston, Massachusetts. To manufacture and import high grade rubber cloths, tubing, etc.

GEORGE D. PEARSON CO., INC., January 22, 1926 (Massachusetts), capital $750,000. Incorporators and officers: George H. Carson, president and treasurer, 176 Lincoln street; Gunhild Wennerberg, vice-president, 4 Northampton street; Saul A. Seder, clerk, 37 Somerset street; Martha Gustafson, director, 1 Frederick street and Evelyn Wahlberg, director, 35 Tower street, all of Worcester, Massachusetts. Principal office, Worcester, Massachusetts. To manufacture and deal in rubber and its by-products, etc.

RE-BILT TIRE & RUBBER CO., November 25, 1925 (South Carolina), capital $5,000. Incorporators and officers: M. W. Jones, president and secretary and K. C. Tannery, vice-president and treasurer, both of Greenville, South Carolina. Principal office Greenville, South Carolina. To manufacture skived reliners and cord boots, vulcanizing and tire repairing.

THE RODEN LAMINATED TIRE CO., March 4, 1926 (Delaware), capital $2,000,000 preferred stock par value $100 and 60,000 shares common stock without nominal or par value. Incorporators: S. L. Mackey, L. C. Christy, and H. Kennedy, all of Wilmington, Delaware. Principal office, Equitable Building, Wilmington, Delaware. To manufacture tires and accessories.

THE SAN-IT RUBBER CO., INC., March 18, 1926 (New York), capital $60,000. Incorporators: Hyman Uadin, 333 Mosholu Parkway, East; Abraham Uadin, 605 Beck street and D. J. Weiner, 3061 Decatur avenue, all of Bronx, New York. Principal office, Manhattan, New York. Rubber products.

WALDRMO TIRE CO., INC., March 11, 1926 (New York), capital $5,000. Incorporators: Morris Kominz, 20 Grand View Terrace; Ira Fink 118 South Union street; Walter B. Slattery, 36 South Union street; all of Rochester, New York. Principal office, Medina, New York. Tires, tubes, and accessories.

The Rubber Trade in the East and South

Compania Explotadora Coahuilense S. A. is one of the oldest guayule rubber producing companies in Mexico. It is capitalized at $1,000,000 and owned by the Madero interests that control large acreages of shrub producing properties. The company operates three factories in Mexico, and produces guayule in large quantities. Baird Rubber & Trading Co., Inc., Woolworth Building, New York, are the selling agents.

F. E. Titus, vice-president in charge of sales for the International B. F. Goodrich Corporation, export organization of The B. F. Goodrich Co., Akron, Ohio, is eastern district manager for the latter company, with headquarters in New York. The transfer of George Sawin, formerly New York district manager, to Chicago as district manager, is announced by officials.

Press reports state that the Goodyear Tire & Rubber Co., Akron, Ohio, has awarded a contract for the building of a six-story factory branch and distributing plant at 58th street and Eleventh avenue, New York, N. Y., the new structure to measure 100 by 166 feet.

E. M. & E. Waldo, Inc., 11 Broadway, New York, N. Y., manufacturers and importers of colors used by the rubber industry, will during the month of April transfer their headquarters from their New York office to their factory at Muirkirk, Maryland. The New York office will, however, be continued as a sales division, and will be in charge of M. J. Simonson.

The Dexter Rubber Manufacturing Co., Goshen, New York, manufactures a complete line of tire accessories, these including adjustable tire flaps, skived cord boots, reliners, patches, cements, and tube repair kits. The organization reports that business this year is 100 per cent greater in volume than during the same period last year. E. R. Dexter is president.

Ray L. Cathcart, formerly New Jersey Zinc Co.'s district sales manager for Pittsburgh territory, is now vice-president of the E. E. Zimmerman Co., 713 Bessemer Building, Pittsburgh, Pennsylvania. He will continue to serve the rubber industry, however, as the Zimmerman organization specializes in the manufacture of materials used in rubber compounding. Mr. Cathcart has had occasion to visit various parts of this country, as well as Canada, during the past ten years, and has come into direct contact with many of the American rubber companies.

Ray L. Cathcart

Under the name of R. J. Funkhouser & Co., operations are being carried forward at the plant formerly owned by the Sure-Foot Heel & Rubber Co., Gettysburg, Pennsylvania. The new company has been incorporated for $100,000, and plans provide for an increase in the factory output to 40,000 pairs of heels daily. R. J. Funkhouser, who purchased the property on November 14, 1925, is president and one of the directors of the organization, while R. J. Bowers is secretary-treasurer and also a director.

The New York branch of the Pennsylvania Rubber Company of America, Inc., Jeannette, Pennsylvania, has been moved from 2006-8 Broadway to 125 West 68th street, the new location providing excellent storage facilities. L. J. Waldron, sales manager of the Pennsylvania organization, recently returned from a trip through the midwest and southwest, where he visited branch offices and distributers. He reports good business conditions.

The Empire Tire Co., distributer of Empire cord and balloon tires, announces the removal of its sales rooms and warehouse to the Guaranty Industrial Building, 2401-2415 Chestnut street, Philadelphia, Pennsylvania.

Executives of The Norwalk Tire & Rubber Co., Norwalk, Connecticut, report that the past year has been the most successful one in their company's history, while many improvements have been made both in the Norwalk plant and in the products. New officers have been recently elected as follows: W. B. Miller, president; J. W. Ingram, vice-president; Alexander S. Banks, vice-president; and W. L. Young, secretary and treasurer.

The Cutler-Hammer Manufacturing Co., Milwaukee, Wisconsin, specializing in electric controlling devices used by the rubber industry, has opened a new sales office in the Healey Building, Atlanta, Georgia. This new division will care for the trade in the states of North and South Carolina, Georgia, Florida, Mississippi, the eastern section of Tennessee, and southern Alabama, while the General Machinery Co. will act as distributer in the northern half of Alabama.

The Kanawha Rubber Co., Dunbar, West Virginia, is now carrying on operations in the plant formerly owned by the Dunbar Rubber Co., and is producing reclaimed rubber by a special process. Output by the Kanawha organization is being increased, plans calling for a daily production by the first of April of 10 tons daily. C. E. Siegfried is president.

Robert Denham, who for a number of years has been connected with The Cooper Corporation, Cincinnati, Ohio, has been appointed special representative for the Nashville territory, his duties including the handling of Cooper tires and batteries.

The Lawson Rubber & Manufacturing Co., Inc., 1329 Plowman avenue, Dallas, Texas, specializing in automobile and tire accessories, reports that sales were more than $250,000 during 1925, with prospects for more than doubling this figure during 1926. During the past year the company purchased an additional fifteen acres, the factory buildings now covering a floor space of more than 64,000 square feet. Executives include: J. R. Lawson, president; E. Robert Lawson, vice-president; B. H. Abbott, secretary; and C. F. Lawson, treasurer.

Frank Brewster Superintendent U.S.R.R. Co.

Frank H. Brewster has assumed the duties of general superintendent of the United States Rubber Reclaiming Co., Buffalo, New York, succeeding his brother Charles B. Brewster whose sudden death occurred March 10, 1926.

Frank H. Brewster was engineer in charge of the erection and equipment of the Buffalo plant and for many years was superintendent and technical engineer. He released the duties of superintendent only 3 years ago to his deceased brother.

Acting Vice-President of Westinghouse Organization

The recent appointment of Samuel L. Nicholson as acting vice-president of the Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pennsylvania, brings into greater prominence a man who is recognized as one of a group of modern electrical leaders who have grown up with the industry and are largely responsible for its remarkable development. A native of Philadelphia, Pennsylvania, Mr. Nicholson began his business career in 1887 in the Novelty Electric Works of that city. Later he became connected with several electrical organizations, his association with the Westinghouse company beginning in 1898.

In 1902 he was appointed manager of the company's industrial department at East Pittsburgh, in 1909 he was made sales manager, while in 1917 he was appointed assistant to the vice-president and was considered an important factor in the organization's executive department. Mr. Nicholson was the first president of the American Association of Electric Motor Manufacturers, now known as the Electric Power Club, while he also assisted in the formation of the American Gear Manufacturers' Association and the Stoker Manufacturers' Association. In 1921, as chairman of the Electrical Manufacturers' Council, he represented the electrical industry on the National Industry Conference Board. He is also a member of the Electrical Safety Conference, the American Statistical Association and the Bureau of Personnel Research for the Carnegie Institute of Technology.

The Rubber Trade in Rhode Island

The general tendency in the rubber industry of Rhode Island has been toward better business conditions ever since the beginning of the new year and, in fact the first three months of 1926 show the best quarter's business for a long time. Some plants are now running five days a week instead of four and at least one is operating day and night shifts in some of its departments. The most encouraging features are the indications that point to a continuance of the favorable conditions for an apparently indefinite period.

Among the plants in Providence the only change in conditions as compared with a month ago is favorable. All are reported as running full time and resident labor is well employed. Producers of novelty, mechanical and medicinal rubber goods are busy with good bookings on hand. At Woonsocket, all plants are also operating on full time schedules with very little unemployment. Bristol rubber workers are on a five-day-week basis and it is expected that this situation will continue for some time to come.

Fifty foremen of the Sundries and Hard Rubber Divisions of the United States Rubber Co., assembled at the Valley and Hemlock street plant, Providence, Rhode Island, at noon March 18 to listen to a talk on "The Foreman's Responsibility in Accident Prevention," given by Henry L. Burdick, a member of the executive committee of the Providence Safety Council. Mr. Burdick's talk followed the presentation of the safety play, "The Grim Reaper," before nearly 300 of the employes of the company, shown under the auspices of the plant service committee of the Providence Safety Council Industrial Club.

On March 26 the Rhode Island Chapter of the American Chemical Society held a meeting in the society's rooms, 44 Washington street, Providence, at which A. R. Nichols, chief chemist of the Hard Rubber Division of the United States Rubber Co., discussed "How Hard Rubber is Made and Some of its Uses." G. C. Hostetter was chairman of the meeting.

A second report of Zenas W. Bliss, receiver for the Bourn Rubber Co., Providence, Rhode Island, covering the period from July 7, 1925 to January 19 last, showed a cash balance on July 7 of $14,036.39 and the receipts since then of $129,409.11, making a total of $143,445.50. Of the receipts, collections from accounts receivable totaled $19,308.55 and from the sale of the plant on Warren street, Providence, to V. B. Phillips, the sum of $108,568.25 was realized. Disbursements amounted to $85,963.23 leaving a cash balance January 19, 1926, of $57,482.27. General claims of an aggregate principal amount of $257,183.61 have been allowed by the court, and claims now in dispute have an alleged principal amount of $72,382.26. The receiver has on hand or collectible the sum of $60,702.51 which, together with the unpaid purchase price of the property and business amounting to $41,431 make a total of $102,133.51 available for expenses of the receivership and distribution to creditors. The receiver estimates further expenses

will not exceed $15,000. A first dividend of 15 cents on the dollar will be paid to creditors whose claims have been allowed. Mr. Bliss states that if all disputed claims were allowed, there would be approximately 25½ cents on the dollar available for distribution to the creditors.

Nearly 1,500 persons crowded into Elks' Auditorium to attend the fifth annual musical show and dance given by the Mutual Benefit Association of the Davol Rubber Co., Providence, Rhode Island, last month. The musical comedy represented an ancient royal court with the king, accompanied by guards, jesters and merrymakers. After the play there was dancing until midnight.

A two-story factory and office building will be erected for the Davis-Jones Insulated Wire Co., on the firm's property in Phillipsdale near the Pawtucket line. It is expected that work will commence with the opening of spring weather.

There has been a gradually increasing activity at the plant of the National India Rubber Co., Bristol, Rhode Island, ever since the beginning of the present year and indications are favorable, not only to a continuance for an indefinite period but for further improvement. Beginning March 15 the braiding room of the wire department of the plant began operations on a day and night shift with a five-days-a-week schedule. There are more than 400 operatives employed in the wire division of the plant.

The Pawtucket plant of the Ninigret Co., a subsidiary of the Fisk Rubber Co., by whom it is being operated in manufacturing tire fabric, has increased its working force and output gradually since the opening of the new year. Approximately 450 operatives are now working two shifts, and the day and night shifts which have been employed since the middle of February may be continued for some time.

The Columbia Narrow Fabric Co., Shannock, Rhode Island, announced that smocks and other types of wearing apparel will be furnished free to its employes. This clothing has been designed for its appearance and safety to the employe while working near or about machinery.

The automobile tire business formerly operated by Burdon & Mason, 130 Main street, Pawtucket, Rhode Island, has been purchased by William P. Watson, Jr., sales agent, and Norman A. Messenger, general manager. The business is to be incorporated under the laws of Rhode Island.

At the financial town meeting of Johnston to be held April 10 an appropriation of $850 will be asked for with which to purchase 600 feet of fire hose for the fire department.

The Rubber Trade in New Jersey

A majority of the New Jersey rubber manufacturers report very good business with every indication of a prosperous spring and summer season. However, one or two firms say that orders are not as large as usual at this time of the year. Trenton plants continue busy on mechanical goods of all kinds, the largest volume product being molded hose. Manufacturers will continue making this hose until June 1, or until there is sufficient stock in the warehouses to fill summer orders. Tire and tube production slackened up a little during the past month and factories are running about 75 per cent of normal.

The Joseph Stokes Rubber Co., Trenton, New Jersey, making hard rubber goods exclusively, reports that business has improved considerably during the past month and that summer prospects are very good. The increasing demand from the automobile trade is a big asset to the Stokes company.

The Murray Rubber Co., Trenton, New Jersey, continues busy although some mail order business has dropped off a little. The factory is operating normally on orders for tires, tubes and mechanical rubber goods. The company manufactured about 8,000,000 feet of molded hose during the winter for the spring trade.

The Ajax Rubber Co., Trenton, New Jersey, continues to operate at 75 per cent of normal on both tires and tubes.

A. Boyd Cornell, secretary of the Hamilton Rubber Manufacturing Co., Trenton, New Jersey, has been appointed receiver for the Sarco Co. of New Jersey, Trenton, printers and engravers. Mr. Cornell's bond was fixed at $50,000.

Employes of the Fineburg Auto Tire & Accessories Co., Trenton, New Jersey, recently held their annual dinner and entertainment at Hillwood Lakes, near Trenton. Herman Fineburg acted as toastmaster.

The Pocono Rubber Cloth Co., Trenton, New Jersey, is busy on orders for spring delivery. The company reports increased sales of rubber golf bags and rubber racquet covers.

The Luzerne Rubber Co., Trenton, New Jersey, reports that business has dropped off a little during the month, but officials believe that it will soon improve.

The Michelin Tire Co., Milltown, New Jersey, which operates a large plant in Clermont-Ferrand, France, where its main office is located, has taken steps to boost the birth-rate of that country by offering its employes 900 francs extra annually for each child born, these payments to continue until the children are sixteen years of age, or until the father dies.

On March 14 fire destroyed the plant of the Pierce-Roberts Rubber Co., Trenton, New Jersey, manufacturer of druggists' sundries and automobile accessories. The plant was one story brick, 70 by 160 feet, with a new addition of 70 by 64 feet. All the office contents were also destroyed. The company was very busy and operating at night. H. W. Roberts, Trenton, New Jersey, is president of the company, and C. A. Pierce, Glen Ridge, New Jersey, secretary. The plant will be rebuilt.

The Lambertville Rubber Co., Lambertville, New Jersey, is building a new fireproof storehouse, 31 by 92 feet. The company is very busy again.

Charles E. Stokes, Jr., superintendent of the Home Rubber Co., Trenton, New Jersey, has been appointed a member of the traffic bureau extension committee of the Trenton Chamber of Commerce.

The Essex Rubber Co., Inc., Trenton, New Jersey, manufacturer of mechanical goods, and rubber soles and heels, is engaged in repairing the damages caused by a recent fire, and is rebuilding a two-story structure, measuring 50 by 200 feet, and also a one-story building, 60 by 200 feet. These operations are being carried on without interfering in any way with the plant production, while the utilization of a recently completed warehouse enables the company to house some of its subordinate activities. C. H. Oakley is president.

The Overman Cushion Tire Co., Belleville, New Jersey, reports net sales for the year ended December 31, 1925, amounting to $2,792,052.02, and net profit of $151,005.02. Executives of the organization include the following: M. C. Overman, president; C. R. Rinehart, vice-president; Benton Overman, vice-president; E. Burnell, vice-president; and James F. Gill, secretary and treasurer.

The Carrier Engineering Corporation, 750 Frelinghuysen avenue, Newark, New Jersey, which for some years has been specializing in air conditioning, has acquired all of the capital stock of the Atmospheric Conditioning Corporation, Philadelphia, Pennsylvania. Several of the executives formerly connected with the last-mentioned concern have joined the forces of the Carrier organization.

Jenkins Bros., 80 White street, New York, N. Y., an organization specializing in the manufacture of valves, maintains in addition to its two large plants at Bridgeport, Connecticut, and Montreal, Canada, another factory at Elizabeth, New Jersey, which is devoted exclusively to the manufacture of mechanical rubber goods. Here are produced pump valves, sheet packings, gaskets, gasket tubing, union rings, washers, and rubber composition discs. In the manufacture of these goods no rubber substitutes are used, while

each article bears the well-known Jenkins "Diamond" trade mark.

Veteran Hard Rubber Man

Isaac Q. Gurnee, president and treasurer of the Superior Hard Rubber Co., Butler, New Jersey, started as a boy with the Rubber Comb & Jewelry Co., growing up with that organization and its successors, The Butler Hard Rubber Co. and the American Hard Rubber Co. Remaining with these concerns for forty years, and holding successively various important positions, he resigned in 1919 as department superintendent in order to organize and build up the plant now known as the Superior Hard Rubber Co.

Isaac Q. Gurnee

During Mr. Gurnee's life he has seen the hard rubber industry in Bloomingdale and Butler grow from its earliest beginnings, with the establishment in 1869 of the Newbrough Hard Rubber Co., a concern manufacturing dental rubber. In 1872 this organization was succeeded by the Union Vulcanite Co., the plant being purchased in 1876 by S. S. Sonneborn and Myer Dittenhoffer. The last-named company was fortunate in securing the services of William Kiel, a pioneer in the hard rubber industry of Germany and France, and under his wise management the concern developed into one of the largest rubber factories in the world. For over forty years Mr. Gurnee was associated with Mr. Kiel as his right-hand man.

The Rubber Trade in Massachusetts

As the rubber footwear companies approached the end of their fiscal years on March 31, a general quiet trend pervaded the trade here. Several plants shut down for inventory, although there was no pronounced curtailment in schedules.

The tire industry here seems to be in the throes of bearish sentiment, due to a combination of factors. The publicity given the rubber situation has had a detrimental effect, and the price cut, February 1, has led the general public to believe that prices would go down at the same rate they went up. Northern New England was buried in snow until late in the month, and road conditions have been so bad around Boston that driving has been on a for-business-only basis. By April 1, shipments are expected to swing back to normal with the season.

The bright spot in footwear is the large number of fall orders now being booked by salesmen. The February snowstorms cleaned up the dealers' shelves in good shape, and made what looked like an off season, a good one. Advance tennis business is not particularly heavy yet but with the predicted early spring this line will move shortly.

Heels and soles are moving in only fair volume. Manufacturers' heels are in good demand owing to shoe activity, but cobblers are quiet in this normally the off-season of the year. Soles seem to have been hit the hardest by price increases, as the shoe factories stocked up ahead prior to the advance, and current shipments are very light.

Mechanical goods are described as spotty, while reclaiming has experienced no let-up in capacity operations.

The National Association of Cotton Manufacturers, 80 Federal street, Boston, Massachusetts, will hold its semi-annual meeting on the afternoon and evening of April 16, 1926, at the Copley-Plaza Hotel, Boston. Topics of current interest will be discussed.

Ownership of the laboratory formerly maintained by W. B. Pratt, Inc. has been acquired by a new organization to be known as Research, Incorporated, 31 Old Heath street, Boston, Massachusetts, which company has also secured ownership of the Aqua Rubber Co., a concern specializing in the production of dispersed rubber compounds. Under the management of Research, Incorporated, W. B. Pratt and his associates will continue their laboratory activities relating to aqueous dispersions of rubber, rubber compounds and substitutes, gums, waxes, etc.

During the past six months the Converse Tire Co., Malden, Massachusetts, has been adding to its output certain new lines of balloon and high pressure tires and tubes, as well as a low-priced tube, known as the "Hampshire." John K. Converse has been appointed sales manager, the other executives being M. M. Converse, president; and Hugh Bullock, treasurer.

H. O. Allyn succeeds L. J. Waldron as manager of the Boston branch maintained by the Pennsylvania Rubber Company of America, Inc., Jeannette, Pennsylvania. Mr. Allyn has been associated with the organization since 1917.

Thomas M. Dillon has joined the advertising department of the Hood Rubber Co., Watertown, Massachusetts, and is in charge of production of printed materials.

Paul W. Litchfield, Class of 1896 Massachusetts Institute of Technology, vice-president of the Goodyear Tire & Rubber Co., Akron, Ohio, has been nominated with eight others for membership in the corporation of that institution, the term extending to June, 1931. Three out of the nine nominated are to be elected by a postal ballot which will be completed by June 1.

The Converse Rubber Shoe Co., Malden, Massachusetts, announced that the plant would be idle for several days from March 20. Necessary repairs on the machinery and the taking of inventory were accomplished during the shutdown. When the shop reopens, 1,500 employes will be put on a full week basis instead of a five-day week as has been in operation during the past season. February sales were the largest in the history of the company.

For the third time in five years, the rapid increase in business of the Lee Tire & Rubber Co.'s Boston branch makes a move for larger quarters necessary. This time the company goes to automobile row on Commonwealth avenue. Guy W. Niles, New England manager, looks for a $3,000,000 annual business in the new location.

Temporary receivers have been appointed for the Sawyer Boot & Shoe Co., Freeport, Maine, in response to a petition filed by the Cambridge Rubber Co., and the United States Rubber Co., in the United States District Court. The firm is said to be solvent but careful management is needed to preserve assets, reported to be more than liabilities. This company has been a wholesale distributer of heavy and sporting rubber footwear in Maine for many years.

Firestone-Apsley Rubber Co., Hudson, Massachusetts, has moved its Boston office from Atlantic avenue where it has been located for many years to Lincoln street, where larger quarters are provided in the heart of the boot and shoe section.

Frank W. Gorse Co., Needham, Massachusetts, manufacturer of covered rubber products for corset sections, elastic supports, etc., reports good business in its line. Arthur W. Littlehale is sales manager.

Friends of E. B. Pearson, president of the Pearson Rubber Co., distributers of Tyer and Lambertville footwear, and formerly New England sales manager for the Converse Rubber Shoe Co., extended their sympathy on the untimely death of his son who passed away suddenly from a sinus operation.

The rubber footwear division of S. B. Thing & Co., Inc., 301 Congress street, Boston, for many years distributers of Hood seconds, has been absorbed by the Hood Products Co., and the stock formerly carried by them moved to the Watertown Arsenal, leased by Hood. The original Thing selling organization has been retained intact.

The Emery Heel Co., manufacturer of Travelite heels in the old Fellsway rubber plant, Medford, Massachusetts, has opened a Boston office at 60 South street.

Urges Cooperation in Crude Rubber Problems

After declining for the past nineteen years to address a public meeting, Edgar B. Davis, former vice-president of the United States Rubber Co., made a short speech on March 2 before the Kiwanis Club of Brockton, Massachusetts, in which he reviewed certain problems now confronting the American rubber industry. In the course of his remarks he particularly urged that the great oil, automotive and rubber manufacturing industries unite in an attempt to secure an equitable share in the plantation rubber industry, which industry, he stated, was due to British vision, pluck, energy and patience.

Mr. Davis also pointed out that while the United States is of all nations the most economically independent, yet the weakest point in the country's commercial structure is its dependence upon Great Britain for rubber. "If plantation rubber should disappear the rubber manufacturing, the automotive manufacturing and a large part of the oil industry, and in addition all the industries in the great cycle, would collapse. Four million people" said Mr. Davis, "are employed in these industries, which means, according to accepted figures, that over 14,000,000 of our fellow citizens are dependent for support upon a British controlled product. These people and capital to the extent of about $16,000,000,000 are dependent upon an industry in which America has invested but about $35,000,000."

The Boston Automobile Show

The Boston Automobile Show opened auspiciously on March 6 and continued through the following week to March 13, with record breaking interest and attendance reported. Although the tire companies followed their usual policy in refraining from exhibiting at the show, local tire men were in evidence everywhere and kept close touch on the situation in order to gage their potential business when the spring rush starts after April 1.

The Rubber Trade in Ohio

Ohio rubber factories are now gradually increasing production, following a temporary recession in the tire industry during February and March. Indications are that early in April all departments of the leading rubber companies will be operating at capacity. Retail tire business showed signs of recovery during the latter part of March, and continues to improve. Sales of tires are reported at least 25 per cent larger than they were a month ago.

Rubber footwear and mechanical rubber goods business is very satisfactory. While tire sales suffered from the effects of severe cold weather and heavy snowfall, the footwear industry has enjoyed almost unprecedented prosperity this winter. Footwear departments of the Goodrich and Firestone companies have been and still are running at capacity, and for some time they were behind on orders. Sales of rubber heels and soles have also made good gains.

Despite a wildly fluctuating crude rubber market, resulting in a downward trend in prices of finished products, preliminary reports reveal that the rubber industry in Ohio during the first quarter of the year was better than some authorities had anticipated. Officials of one of the leading companies in Akron stated that sales were nearly 30 per cent above those in the same period of last year.

The larger rubber companies, including Goodyear, Goodrich, Firestone and Miller, have been able to maintain higher production schedules during the past two months than their smaller competitors. At no time have their operations fallen below five days a week, with three shifts of workers employed, while the latter were forced to curtail to three or four days a week schedules. In the Akron district daily tire output is slightly above 100,000 casings and 120,000 tubes. Goodyear and Firestone are turning out more than 60,000 of this total.

While there has been less talk recently of another tire price cut, a downward revision ranging from 10 to 15 per cent is being made in the prices of many mechanical rubber goods.

The stage was set, in the opinion of some authorities, for lower tire prices early in March, when crude rubber declined to around 50 cents a pound. However, recent strength in the market is believed to have caused postponement, at least temporarily, of any such action. Despite charges of profiteering on the part of American rubber manufacturers made by a few disgruntled Congressmen, it is a fact that rubber being consumed in most plants today costs substantially more than current prices, and there are thousands of high cost tires in the hands of manufacturers and dealers. If tire prices are reduced any time in the near future it is generally agreed by Akron authorities that both manufacturers and dealers will suffer heavy inventory losses.

The B. F. Goodrich Rubber Co., Akron, Ohio, has placed L. A. McQueen in charge of tire sales and advertising. As assistant general sales manager Mr. McQueen will divide responsibilities with C. E. Cook, who will direct sales activities along other lines, such as footwear, flooring, mechanical rubber goods, druggists' sundries, etc. H. C. Miller continues as assistant general sales manager in charge of products used by car manufacturers.

The following have been recently elected as executives of the Seiberling Rubber Co., Akron, Ohio: F. A. Seiberling, president; C. W. Seiberling, vice-president and treasurer; W. S. Wolfe, vice-president in charge of production; H. L. Post, vice-president in charge of sales; and W. E. Palmer, secretary and assistant treasurer. Directors include the first four officials named, and W. A. M. Vaughan, B. Q. Etling, and George T. Bishop.

Charles W. McDaniel, formerly manager of the tube sales department of The Goodyear Tire & Rubber Co., Akron, Ohio, has resigned to become vice-president and account executive of The Eddy & Clark Co., Akron, Ohio, advertising and sales counsellors.

A. Schrader's Son, Inc., Brooklyn, New York, the largest manufacturer of tire valves and pressure gages in the world, will erect a new assembling plant in Akron, Ohio, to cost approximately $300,000. The building will be five stories high, 52 by 200 feet, with about 65,000 square feet of floor space.

Automatic machinery to be installed will make the Akron branch the most modern assembling plant in the country. It will have an estimated capacity of 150,000 tire valves a day, more than sufficient to take care of the needs of Akron tire factories and jobbers in this section of the country.

At the recent annual meeting of The Miller Rubber Co., Akron, Ohio, the following executives were elected: Jacob Pfeiffer, president; C. T. Grant, vice-president; William F. Pfeiffer, secretary, treasurer and general manager; R. R. Jennings, comptroller and assistant treasurer; Charles R. Wetsel, assistant secretary; W. H. Hackett, assistant secretary and assistant treasurer. Directors include the first three officials named, and also F. B. Theiss, J. M. Doran, F. C. Millhoff, R. T. Griffiths, William G. Dietz, H. T. Holmes, and Charles A. Morris.

Total sales for 1925 of the Star Rubber Co., Akron, Ohio, were $2,000,000, it is reported by President L. H. Firey. The company's 1924 sales were $1,840,000. Profits for 1925 after depreciation, taxes and other items amounted to $50,000.

Construction of retaining walls for a new $60,000 powdered coal building is to be started at once by the Firestone Tire & Rubber Co., Akron, Ohio. The structure will be erected adjoining the new fabric warehouse at Plant No. 1, which has progressed to concreting the first floor.

H. J. Young, manager of factory accounting, cost and payroll division for the Goodyear Tire & Rubber Co., Akron, Ohio, has

been selected as comptroller for the Goodyear Tire & Rubber Company of California, Los Angeles, California. He will assume the position April 1. Mr. Young has been manager of the Goodyear factory accounting department since 1920.

R. H. Harrington has been appointed advertising manager of The American Rubber & Tire Co., Akron, Ohio. Mr. Harrington was formerly associated with the Goodrich and Seiberling organizations.

John F. Joseph, formerly associated with the Goodrich organization as superintendent of mechanical divisions, has since December 1, 1925, been serving as vice-president and general manager of The Cincinnati Rubber Manufacturing Co., Cincinnati, Ohio. The last-mentioned company manufactures mechanical rubber goods, specializing in the production of belting, hose, molded goods, and paper mill rolls.

The Giant Tire & Rubber Co., Findlay, Ohio, has now a plant capacity of about 1,500 tires and 2,500 tubes daily. Business during the winter has been satisfactory in volume, while earnings for the first three months of the company's fiscal year, beginning November 1, have been several times the amount earned during the first five months of the year previous. C. E. Hart is president.

The Sun Rubber Co., Barberton, Ohio, has been considerably increasing its plant activities, recently erecting several factory additions. The company reports an increase in sales this year of practically 100 per cent as compared with the year previous, while present indications are that sales during the entire year 1926 will be in excess of $500,000. Products include druggists' sundries and miscellaneous molded rubber goods. J. T. McLane is president.

The Pioneer Rubber Co., Willard, Ohio, reports that profits from operations during 1925 were over $100,000, while after deductions a surplus of $88,000 was carried forward. The company's earnings during the past year were four times the dividend requirements for the preferred stock. T. W. Beelman is president.

On February 15 The Cooper Corporation, Cincinnati, Ohio, considerably increased its production of tires, while there are indications that a still greater output will soon be necessary. Both balloon and high pressure casings are being manufactured. John F. Schaefer is vice-president in charge of tire production.

Plant improvements during 1925 by The Aetna Rubber Co., 811-815 East 79th street, Cleveland, Ohio, consisted mainly in enlargements of manufacturing facilities at the Ashtabula plant, with extensive additions for warehousing and shipping. At the Cleveland main offices various rearrangements helped to make possible the largest volume of business ever enjoyed by the company. Newly elected officials include: Thomas Ferry, formerly president and now chairman of the board; S. T. Campbell, president and general manager; A. J. Huston, vice-president and sales manager; H. J. Kappler, vice-president and factory manager; E. T. Slinkard, secretary and treasurer; and F. R. Jeffreys, assistant treasurer.

A leave of absence amounting to a practical retirement has been granted John R. Gammeter, consulting engineer of The B. F. Goodrich Co., Akron, Ohio. The leave was granted to provide more time for his personal affairs. However, he will still serve the company in a consulting capacity and be in almost daily contact with the engineering department. Mr. Gammeter has been active in the company's mechanical development for thirty years and has originated a number of innovations in rubber goods manufacture, being credited with 200 patents, including the Gammeter safety valve, widely used in lighter-than-air crafts.

The following directors of the Northern Rubber Co., Akron, Ohio, were recently elected: L. J. Schott, Edmund Shaw, Louis Schott, Dr. A. A. Kohler, Owen Moynihan, of Akron; Stanley Baltzly, A. Z. Wheeler, Perlee Snyder, Frank W. Siffert, W. E. Hemperly of Massillon; F. M. Howard, J. J. Bower, of Columbus, and J. B. Imler, of Canton, Ohio. The company manufactures tires and tubes and the plant capacity was recently doubled.

A. J. Fleiter, vice-president and general manager of the Akron Standard Mold Co., Akron, Ohio, announces the appointment of W. E. Greer as sales representative. Mr. Greer was with Miller Rubber Co. for nine years as superintendent of tire production.

General Tire & Rubber Co. Expanding

A building program of the General Tire & Rubber Co. plant, Akron, Ohio, will within the next few months increase production at least 40 per cent. The improvements include two three-story wings, added to the main factory building, each 100 by 40. They are of concrete steel fire-proof construction and will provide an additional 70,000 square feet of factory floor. Besides these extensions the company has completed and now occupies a new wing built to the office structure, now twice as large as originally.

Litchfield Elected President of Goodyear

Paul W. Litchfield was elected president of the Goodyear Tire & Rubber Co., Akron, Ohio, at the stockholders' meeting held in Akron on March 29. Frank K. Espenhain, vice-president in charge of sales, becomes first vice-president, succeeding Mr. Litchfield; E. G. Wilmer was reelected chairman of the board; C. F. Stone, C. E. Slusser and C. A. Stillman were elected vice-presidents. Mr. Slusser will supervise all plants outside of Akron, and William Stevens will be superintendent of the Akron plant.

Goodrich Executives

The following executives of The B. F. Goodrich Co., Akron, Ohio, have been recently chosen: B. G. Work, president and chairman, board of directors; C. B. Raymond, vice-president and vice-chairman, board of directors; W. A. Means, vice-president; W. O. Rutherford, vice-president; L. D. Brown, vice-president and treasurer; H. Hough, vice-president and comptroller; F. C. Van Cleef, secretary; W. C. Arthur, assistant secretary; J. L. McKnight, assistant secretary; V. I. Montenyohl, assistant treasurer; L. L. Smith, assistant treasurer; H. C. Miller, assistant general sales manager; C. E. Cook, assistant general sales manager.

Directors: Term expiring 1926, D. M. Goodrich, H. Hough, C. B. Raymond, H. E. Raymond, E. C. Shaw, F. C. Van Cleef; term expiring 1927, B. G. Work, Harold Stanley, Waddill Catchings, H. K. Raymond, W. O. Rutherford, A. A. Tilney; term expiring 1928, L. D. Brown, W. C. Geer, C. C. Goodrich, F. H. Mason, W. A. Means, A. H. Noah.

Over Twenty Million Balloon Tires

Despite the fact that 1925 production of all pneumatic tires in this country was about 17.9 per cent more than the 1924 output, an increase in the production of balloon tires in 1925 over 1924 was more than 250 per cent, figures reveal. The actual output was 20,750,000, as compared with approximately 5,800,000 in 1924. The statistics are compiled by computing 100 per cent production on the basis of Rubber Association figures representing 75 per cent of the industry and which publish a figure of 15,567,644 for the balloon tire output in 1925.

Balloon and high pressure cord production made up 85.9 per cent of the total 1925 pneumatic tire output. Fabric casings represented but 14.1 per cent of total. But little more than 5 per cent of total production is expected this year of fabric tires.

Using the Rubber Association figures which represent 75 per cent of the industry as a basis, the high pressure cord production in 1925 was but 3.4 per cent more than for 1924. The output of high pressure tubes pointed to a decrease of 6.7 per cent as compared to 1924. The output of balloon inner tubes last year was 323.3 per cent more than in 1924.

Midwestern Notes

The Chicago offices maintained by H. Muehlstein & Co., Inc., at 114 West Van Buren street, have been moved to 327 South La Salle street. The company specializes in crude and scrap rubber.

The Mid-West Cotton Mills, Niles, Michigan, commenced operations in March, the organization planning to produce 40,000 pounds of cord tire fabric weekly. Part of the factory output will include hose and belt ducks for the mechanical rubber goods trade. Executives are: M. M. Miller, president; Poncet Davis, vice-president and director of sales; and George Carrigan, treasurer and general manager.

The factory of the Gillette Rubber Co., Eau Claire, Wisconsin, is running three eight-hour shifts, while daily production is at the rate of 3,000 tires, 6,000 inner tubes, and 2,000 bicycle tires. Additional machinery is also being installed which will increase the tube output to 10,000 a day, and the tire production to 3,500 a day. R. W. Hutchens is vice-president and factory manager.

H. J. Hopkins is in charge of the tire branch maintained in St. Louis, Missouri, by the Hood Rubber Co., Watertown, Massachusetts.

Van Cleef Bros., Woodlawn avenue and 77th street, Chicago, Illinois, manufacturing chemists, specializing in the production of friction and rubber insulating tapes, various automobile supplies, etc., report that Paul Van Cleef, executive in charge of production, has been recently commissioned a Major in the Officers' Reserve Corps of the Chemical Warfare Service. Major Van Cleef is a graduate of the University of Chicago and has been very active in the Chicago affairs of the American Chemical Society.

The Rubber Trade on the Pacific Coast

Confident that rubber will be cheaper, Pacific Coast manufacturers are not buying supplies beyond immediate requirements, and incidentally much experimenting is being done with reclaimed rubber, of which there appears to be an ample supply.

General trade conditions continue favorable, and much activity is expected within two or three months in practically all lines. There is a growing demand for mechanical rubber goods from the building trades, and while tire buyers have been chary about another price drop the depleted condition of stocks is forcing them to place many large orders.

The Goodyear Rubber Co., 539 Mission street, San Francisco, California, according to Manager Howard Middleton, reports increased sales of rubber clothing and footwear, and numerous orders for next season's goods, while the demand for mechanical rubber goods was never better. The company has just taken the agency for the sale of wire rope made by the Black Steel & Wire Co., Kansas City, Missouri. The Goodyear company's officers have not been changed in many years. R. H. Pease is president; J. A. Shepard, vice-president; and C. F. Runyon, secretary.

The Chanslor & Lyon Tire & Rubber Co., San Francisco, California, recently entertained over 200 Pacific Coast dealers and salesmen. After a business session and inspection of the Oakland factory, there was a banquet and entertainment at the Athens Club.

William O. Standring, of Portland, Oregon, who began business thirteen years ago with the first repair shop in the island of Hilo in the Hawaiian Islands, now has in his Portland buildings 14,400 square feet of salesrooms and carries a stock of 10,000 to 12,000 casings. He has visited 85 per cent of the tire factories of the United States.

Lynn Harvey, divisional manager, India Tire & Rubber Co., Akron, Ohio, has been studying trade conditions in Coast cities.

The Los Angeles Rubber & Asbestos Co., 124 East Third street, Los Angeles, California, is the agent in that city for balata belting and other products of R. & J. Dick, Inc., of Scotland.

An increase of 300 per cent in sales during the past twelve months is reported in Spokane, Washington, by the distributers of C-T-C tires made by the Columbia Tire Corporation, Portland, Oregon.

Harry S. Quine, publicity manager and assistant to William O'Neil, president of the General Tire & Rubber Co., Akron, Ohio, was a recent guest of the Advertising Club at a luncheon in the Biltmore, Los Angeles, California.

Shipments of crude rubber from the Far East valued at over $100,000 and consigned mainly to Denver, Colorado, were received recently in Los Angeles.

President S. W. Hammond of John A. Roebling's Sons Co., of California, offices 624-646 Folsom street, San Francisco, California, reports that the company did an unusually large business last year in rubber covered wire and that indications point to an equally prosperous year in 1926.

The Hood Rubber Products Co.'s Los Angeles branch will soon occupy its own new two-story brick warehouse and office building on Bay street between Wilson and Mateo streets, in the new wholesale tire district. The building has 15,000 square feet of floor space, a railroad spur and every modern merchandising convenience.

The vulcanizers' division of the Los Angeles Automobile Trade Association has taken steps to protect the public against gyp repair jobs. The committee delegated to formulate protective measures consists of George Bellis, Coast branch manager of the Lee Tire & Rubber Co.; Al Monroe, Quaker state distributer; and N. Bershon, Victor distributer. Automobilists are advised to cut every cast-off casing through the bead to prevent their sale to unscrupulous vulcanizers for making "retreads" and "rebuilts."

William F. Pfeiffer, general manager and secretary-treasurer of the Miller Rubber Co., Akron, Ohio, made a personal study of rubber trade conditions on the Pacific Coast last month. He declares that prospects were never brighter.

The Hobbs Battery Co., manufacturer of all-rubber storage batteries, 2019 Bay street, Los Angeles, California, has bought out Mayo & Senn, Seattle, Washington, and has set up a branch battery factory there with R. H. Sterrett in charge.

The Columbia Tire Corporation, Portland, Oregon, has declared a dividend of 24 per cent on its preferred stock, thus clearing up a cumulative obligation extending over three years. Vice-President Alfred A. Aya has been spending considerable time recently with Secretary Louis A. Wyman conferring with dealers in the Southwest.

After a temporary shut-down, the Goodyear Tire & Rubber Co.'s plant in Los Angeles is turning out 6,500 tires and 7,500 tubes daily. The slowing up was due to overproduction and the falling off of spring orders. This condition is rapidly correcting itself, however. President E. G. Wilmer of the parent company in Akron, Ohio, has been a recent visitor. Mr. Wilmer's assistant, John W. Mapel, has been appointed as treasurer to take the place of Edward F. Downs, recently arrested for embezzling company funds; and J. A. McMicken has been appointed as acting controller, the directors thus separating two positions held by Downs.

Charles E. Criss, for the past three years in charge of sales for the General Tire & Rubber Co., Akron, Ohio, has been made branch manager at Los Angeles, California. Mr. Criss has had a wide experience in all branches of the rubber industry and his appointment is a recognition of merit and achievement by officials of the General company.

H. M. Bacon has been appointed Pacific Coast district manager in San Francisco for The B. F. Goodrich Co., Akron, Ohio.

The Reilly Rubber Co., Los Angeles, California, was organized in 1921 by J. R. Reilly, a well known rubber executive. The company's plant was equipped with modern rubber machinery and efficient conveyer systems that insured large output volume of high grade red and gray inner tubes at a low production cost. From an output of 100 tubes daily, production and sales increased to 2,000 tubes in the three years the factory was in operation. Mr. Reilly, president of the company has recently announced that he is retiring from the rubber business and that the plant is to be sold.

The Rubber Trade in Canada

The price decline of crude rubber and Egyptian cotton has made the tire position a precarious one, as manufacturers have purchased rubber and cotton at much higher prices than those now prevailing. Tires advanced five times last year, ranging from 41 per cent to 60 per cent. Recently prices were cut 10 to 12½ per cent, and consumers feel that this cut is not proportional to the five increases. Therefore, it is probable that hand-to-mouth buying will follow, and users will await the reductions that seem inevitable.

The Montreal market for rubber goods continues firm and manufacturers do not anticipate any material change at present, however, there is some talk of reducing rubber packing. Should this occur it will not affect the small dealer but will be more or less of a concession to the few large buyers in the Dominion of Canada. The recent move on the part of tire manufacturers to guarantee prices against decline until May 30 has aided sales considerably.

Wholesale rubber merchants and manufacturers held a meeting in Toronto, March 6, for the purpose of adjusting prices following the general reduction on tires announced on February 8. As a result of this revision, prices of the three cheaper types of tires in the 30 by 3½ class as well as tubes have been reduced from 5 to 8 per cent.

Consideration of a list of uniform prices for all grades of automobile tires, submitted by various manufacturers, was the chief issue before a meeting of the Tire & Automobile Accessory Section of the Retail Merchants' Association held in Montreal on March 9. The price list was arranged in accordance with the fair trading policy now being advocated by the association and was approved by a large attendance of the local dealers who, it is expected, will officially adopt the list.

Present conditions will doubtless make vulcanizing and tire repairing a most profitable line for the next five years at least. The high cost of rubber is bringing back business to the tire repair shops and 1926 will be a banner year for the tire repair man.

Optimism in Western Canada is becoming crystallized into buying activity, according to A. A. Frew, of Winnipeg, Manitoba, western manager of the Canadian Goodrich Co., Ltd., who recently returned from a tour of part of his territory stretching from the Great Lakes to the Rockies.

Recent incorporations include Servus Rubber Products, Ltd., with headquarters at Windsor, Ontario.

The Firestone Tire & Rubber Co., of Canada, Ltd., Hamilton, Ontario, will shortly release a new advertising campaign.

The National Shoe & Leather Trade Association recently held its annual "Habitant" dinner in Montreal. J. H. Cote, special representative of the Columbus Rubber Co., Montreal, Ltd., is president.

The final games in the Rubber Loop took place recently when the Columbus Rubber Co., Montreal, Ltd., won the championship of the league. Second place was cinched by Consolidated, third by Canadian, and fourth by Dominion rubber companies.

The Dominion Rubber System recently suffered a $100,000 loss in Hamilton, Ontario, when the building in which they occupied space was destroyed by fire.

W. E. Wry of the Kaufman Rubber Co., Ltd., Kitchener, Ontario, recently returned from a week's holiday in Northern Ontario.

F. H. Meinzer, manager of the Montreal branch of the Kaufman Rubber Co., Ltd., recently visited the company's factory at Kitchener, Ontario.

N. M. Lynn, sales manager of Ames Holden McCready Rubber Co., Ltd., is visiting the different branches throughout Canada.

The Canadian I. T. S. Rubber Co., Ltd., Toronto, Ontario, manufacturers of rubber goods, will shortly commence a trade paper advertising campaign.

The Firestone Tire & Rubber Company of Canada, Ltd., whose general offices and plant are on the Beach Road, Hamilton, Ontario, has opened a branch at the corner of Cannon and Hughson streets, Hamilton, Ontario. The new branch will handle wholesale business and serve dealers in the Hamilton territory.

Earl Rogerson, sales manager of the Dunlop Tire & Rubber Goods Co., Ltd., Toronto, Ontario, was one of the principal speakers at the recent gathering of the Canadian Bicycle Dealers' Association when they were guests of the Dunlop Tire & Rubber Goods Co., Ltd., and the Canada Cycle & Motor Co., Ltd., at a banquet held in Montreal at the Mount Royal Hotel.

The *Montreal Gazette* under the caption of "Twenty-Five Years Ago" reprints the following from their issue of March 16, 1901: At the annual meeting of the Canadian Rubber Co. the board of directors was elected as follows: Andrew Allan, president; H. Montagu Allan, vice-president; Andrew A. Allan, J. B. Learmont, W. H. Benyon, J. O. Gravel, C. F. Smith, H. Markland Molson and J. J. McGill.

The vice-president and general manager of the Goodyear Tire & Rubber Co. of Canada, Ltd., New Toronto, Ontario, C. H. Carlisle, in a recent interview said in part: "Business is better than a year ago and the figures will equal those of last year if not exceed them.

"However the drop in crude rubber prices has very materially checked the buying movement. Consumers are holding off in anticipation of lower prices, but there is no immediate prospect of a reduction. Normally stock on hand of manufactured goods, raw materials, and goods in transit represent requirements for three months sales. While prices of crude rubber were advancing 500 per cent, prices of rubber goods advanced less than 40 per cent, and it is obvious that it will take some time to liquidate present stocks, and bring into effect a revised schedule of prices."

Only One Canadian Gutta Percha & Rubber, Ltd.

The Canadian organization known as Gutta Percha & Rubber, Ltd., 47 Yonge street, Toronto, has for more than a quarter of a century been an all-Canadian company in every sense of the word. The original establishment, opened about 1880, was a branch of The Gutta Percha & Rubber Manufacturing Co., an American organization, which for a number of years had maintained head offices in Brooklyn, but very recently removed to Buffalo, New York.

In 1887 the above-mentioned Canadian branch was reorganized as a subsidiary company, with the controlling interest owned in Canada. The remaining American shareholdings were soon after bought in, the entire capital stock then being owned by the Canadian concern. A further step taken in 1912 was the reorganization and recapitalization of the business, and the assuming at that time of the company's present title, Gutta Percha & Rubber, Ltd. Branches are now being maintained from coast to coast, as well as a subsidiary organization in England, Gutta Percha & Rubber (London) Ltd. C. N. Candee is president and managing director of the Canadian company.

The Rubber Trade in Europe

Great Britain

Rubber Trade Forecasts

STATISTICS regarding present conditions in the rubber industry continue to appear, many of these compilations containing data of value and interest. Among them is a series of articles published by *The India-Rubber Journal*, and dealing with various phases of the questions now disturbing the rubber trade. In one of these contributions the output of Malayan rubber producing companies during January, 1925 (at 55 per cent of standard production) is compared with that of January, 1926, the totals being respectively 5,389,187 pounds and 9,262,013 pounds. Corresponding figures for Ceylon are 1,071,530 pounds and 1,653,370 pounds. Another periodical in commenting on this tabulation says in part in an editorial entitled "Snags For the Prophets":

That everyone interested in rubber—producers, manufacturers, brokers and shareholders—should be busy estimating the prospects of output, consumption and prices for 1926, is natural. Many snags, however, present themselves, and experience suggests that the prophets will be fairly wide of the mark. January and February have completely falsified the forecasts of December. Again the comparison of January, 1925, with January, 1926, may easily lead the unwary to wholly mistaken conclusions as to the outlook for the rest of the year. From certain figures published, one might anticipate an increase of roughly 100 per cent from Malaya and Ceylon, but when we remember that in January, 1925, the exportable allowance was 55 per cent of a standard production of 400 pounds an acre, while in January, 1926, it was 85 per cent of 500 pounds an acre, we realize how considerable is the scope for error, even in estimates. Then again, outputs and exports have in the past two or three years been very different things. It is the same with prices. . . . Unless all the portents and percentages of the past are to prove a mere will o' the wisp, the consumption outlook for 1926 is not going to leave a very serious surplus in the hands of producers, even though world output amounts to 650,000 tons.

W. D. Campbell, chairman of the Rubber Growers' Association and director of a number of producing companies, recently said:

It seems clear to me that if crude rubber consumption continues to expand at the present rate of progress, as seems likely to be the case, there cannot be much of a surplus—not more than is required to replace stocks. The estimates of exports in connection with this subject are curiously at variance, as will be seen by a glance at the current forecasts of accepted authorities in the press. For my own part, I am expecting prices to rule about the present level for some years to come—of course, with the ordinary market fluctuations. I am not one of those who want rubber to stand at 4*s* a pound, I am content with 2*s* 6*d*.

While addressing the Royal Colonial Institute, Sir Stanley Bois recently said in part:

Fears have been expressed that whatever may prove to be the case this year, there may be an actual shortage of crude rubber supplies later on, but fortunately the high prices recently paid for spot rubber have acted as a great incentive to further plantings and extensions. It must, however, be remembered that plantation rubber is an industry dating back barely 20 years, and in its turn depends in the main upon another—the motor—industry, which has been in existence but little longer. Can we wonder therefore, having regard to all the circumstances, that stability has not yet been attained, or that prices have fluctuated greatly! Rather I think we should congratulate ourselves that, thanks to British enterprise in the creation of vast areas of rubber, and to the rapid expansion of mechanical transport brought about in the main by American initiative (to say nothing of the numerous uses in countless directions to which rubber has been turned to the service of mankind by manufacturers on both sides) an immense advance in the march of civilization has been rendered possible.

Institution of the Rubber Industry—Other Organizations

At the annual dinner on February 8 of the Birmingham Section of the Institution Colin Macbeth presiding pleaded for better trained men in the British rubber industry. While admitting that along certain lines decided advances in knowledge had been made in recent years, he also claimed that greater improvement must be made if the English industry wished to rank with that of America. He said that in Birmingham, Manchester, Glasgow, and London facilities were needed for teaching the major operations required in the rubber industry, such as rubber grading, washing, mastication, mixing, warming, calendering, spreading, etc., and believed that if necessary each manufacturer should arrange in his own works a night school for manual training. In replying, Sir Stanley Bois supported the views of the chairman, but also claimed much more for the British tire manufacturer than Mr. Macbeth had done, believing that in matters of organization and general management the United Kingdom had comparatively little to learn from the United States.

On March 1 the London Section held a meeting at the Engineers Club, Coventry street, when papers were read by J. H. C. Brooking on "Difficulties of Rubber Manufacture," and H. Rogers on "Recent Developments in General Mechanicals." The Institution held its fourth annual dinner on March 8 at the Hotel Victoria, Northumberland avenue, London, Sir Stanley Bois presiding.

Dr. H. P. Stevens gave a lecture on March 1 at the City of London College, taking as his subject, "The Character, Grades and Defects of Raw Rubber."

The Research Association of British Rubber and Tire Manufacturers held a meeting on March 12, while various committees of the Rubber Growers' Association held special sessions on March 15, 17, and 22.

A Non-Skid Rubber Road

Experiments are being conducted on a section of the Uxbridge road at Acton, where the "Safety" type of rubber blocks are being used, an invention of L. Wilton Cox. The new road, some 15,000 blocks of which have already been laid down in one of the busiest sections of Acton, is said to represent a happy combination of the familiar wood paving with all the advantages of a rubber surface, plus the safety to vehicular traffic which is the particular merit of the patent. Standard creosoted wooden blocks are coated with a special rubber solution, while rubber is laid across the blocks in truncated triangular grooves. By means of using an alternate system in the placing of the blocks, a tessellated appearance is secured, an arrangement which is said to prevent skidding.

British Notes

The "rubber boom" in the second half of the past year was responsible for an extensive broadening of the British capital market. Authoritities state that during this period 100 plantation issues were offered, while altogether £13,856,800 of British capital went into rubber, as against £701,400 in 1924. It is said that only the big boom period of 1920-21 drew more money into industry, and, fearing a faulty digestion of securities, many periodicals issued warnings to the public, particularly with reference to the rubber problem. On every £100 of purchase money paid for shares the buyer is charged £1 for stamp duty, the revenue thus gained by the government reaching the remarkably high figure during 1924-25 of £22,758,000.

The Propaganda Department of the Rubber Growers' Association intends to participate in the Building and Allied Trades Exhibition, which will be held at Olympia from April 14 to 28, 1926. A similar participation in the recent Shipping, Engineering and Machinery Exhibition brought gratifying results, and encouraged by their success, the managers of the Rubber Growers'

Association plan to send out a circular letter to rubber manufacturers requesting their cooperation in this activity by furnishing samples of suitable rubber articles or contributing suggestions.

The British Industries Fair, which was held February 15 to 26 at the White City, London, and at Castle Bromwich, Birmingham, included a number of attractive rubber exhibits, while the amount of business done is said to have been in excess of expectations. The absence of displays of automobile tires was however a disappointment to many. A few cycle tires were on exhibit at the stands of the motor cycle manufacturers.

Germany

Statistics for the year 1925 have just been published and reveal increased activity in the rubber industry during the year. Thus imports of crude rubber rose from 238,554 quintals in 1924 to 361,004 quintals in 1925; gutta percha arrivals remained practically stationary, being 1,997 quintals in 1925; balata imports jumped from 3,526 quintals to 6,266 quintals in 1925; and scrap from 42,718 to 92,982 quintals in 1925.

Total exports of manufactured rubber came to 156,096 quintals, value 95,487,000 marks in 1925 against 146,125 quintals, value 72,376,000 marks the year before. Among the articles showing increases were automobile tires, 174,897, instead of 142,927; tubes for automobiles, 219,252 instead of 182,174; tubes for bicycles and the like, 2,996,243 against 2,705,109; belting, 3,188 quintals against 2,393 quintals; hose, 14,994 quintals, against 14,401 quintals; manufactures of rubber combined with fabrics, 14,037 quintals as compared with 13,759 quintals; hard rubber goods and hard rubber, 11,534 quintals, value 11,795,000 marks, instead of 9,803 quintals, value 9,667,000 marks. The decreases included covers for bicycle tires, 1,231,698 instead of 1,365,489; packing 3,110 as compared with 3,415; footwear 4,480 quintals against 4,585 quintals.

The imports of manufactured rubber continue to show a disturbing tendency to rise and during 1925 jumped to 21,326 quintals, value 12,621,000 marks, from 8,735 quintals, value 5,422,000 marks in 1924.

The most important increases took place in imports of rubber thread (1,220 quintals against 765 quintals); automobile tubes (17,784 against 5,788); automobile tires (29,414 against 8,044); elastic goods (5,459 quintals against 3,251); belting (295 instead of 41 quintals).

The Business Situation

Chambers of Commerce reports of the situation in Bielefeld, Braunschweig, Detmold, Göttingen, Goslar, Hannover, Harburg, Hildesheim, Lüneburg, Minden, Oldenburg, Osnabrück, Stadthagen, Verden and Wesermünde, state that during the last quarter of 1925 factory operations failed to improve and in many of the rubber factories concerned working hours had to be cut down and part of the personnel laid off. Several of the smaller concerns have had to close their doors. Two firms in the Hildesheim district are in the hands of receivers.

Local consumption is limited by the general shortage of money, and of late the weather has also been responsible for a curtailing of purchases. Thus the number of bicycle tires sold during the quarter was barely one-third of the quantity sold during the same period of the preceding year. Competition from France, Italy, England, the United States, Japan and Belgium have had a most unfavorable influence on Germany's export business.

Special reports regarding the situation in the Cassel surgical soft and hard rubber industry disclose an equally bad state of affairs—steadily decreasing local consumption, falling off in exports, increased unemployment and part-time schedules. Although the high price of crude rubber has resulted in the announcement of higher prices, in practise the sharp competition of the German factories results in underselling whereby prices are held down to a level in no way proportionate to the prevailing rates for the raw material.

The news from Leipzig is equally depressing. There particular attention is called to competition from American manufacturers who, it is claimed, sell their goods at remarkably low prices in the German market.

The critical state of affairs has again inspired many people with the desire to reorganize and once more plans for concentration and amalgamation appear in the papers. One writer discussing the question in the *Gummi Zeitung* quotes an article in *The India Rubber World* in which the problem of the many small tire manufacturers was dealt with. The interest shown in the matter of amalgamation would appear to indicate a strong tendency in that direction which may possibly eventually take shape.

German Rubber News

Rubber novelties from America are eagerly looked for by German agents. At present, American-made corset inserts, player-piano sheetings, water bottles, aprons, belt material, balloons, gloves and bands are on the local market. German tariff decisions practically bar American bathing caps and hospital sheeting, but these goods are successfully sold by German agents in the neighboring states—Austria, the Baltic States, Czechoslovakia. The coloring of American goods seems to be superior to that of European goods.

The Continental Caoutchouc und Gutta-Percha Compagnie reports gross profits of 7,672,759 marks and net profits of 3,215,443 marks. A dividend of 10 per cent has been proposed.

INTERNATIONAL RUBBER EXHIBITION EXECUTIVES

Among the leaders in the rubber industry who have been chosen to fill important posts at the International Rubber Exhibition, to be held in Paris, France, from January 21 to February 6, 1927, are the following: Lord Colwyn and Georges Schwob, honorary presidents of the Exhibition; and Sir Wyndham Dunstan, who will take charge of the international conferences which will be held in Paris in connection with the exposition. Charles Iung, president of the Associations of French Rubber Manufacturers and French Cable Manufacturers, has consented to accept for the International Exhibition the office of president of the French Committee.

FRENCH RUBBER NEWS

Manufacture de Montreuil is a new company formed to manufacture and sell artificial leather and all fabrics for rubberizing and in general all fabrics proofed or that can be proofed. The capital is fixed at 6,000,000 francs and headquarters will be at 16, boulevard de Chateaudun, Montreuil (Seine).

Société des Caoutchoucs du Gabon will study and exploit rubber-bearing trees and vines besides oil-palms and other trees and shrubs. The offices are at 12, rue Boissy-d'Anglas, Paris, and the capital is 400,000 francs, in shares of 500 francs all subscribed.

A. Fontaine & Cie., Pneumatiques Font-Eco, capitalized at 2,500,000 francs, is now being formed and will retread tires, also manufacture and sell new tires and handle waste, general automobile accessories, etc. The firm will be established at 19 boulevard Bineau Levallois-Perret (Seine).

SWEDEN'S RUBBER TRADE

Recent statistics show that while imports of crude rubber into Sweden declined from 1,809,119 kilos in 1924 to 1,717,133 kilos in 1925, imports of manufactured goods increased from 2,916,738 kilos in 1924 to 3,815,823 kilos in 1925; of this total footwear accounted for 159,971 kilos in 1924 and 250,100 kilos in 1925.

Exports included rubber waste: 217,992 kilos in 1924 and 525,145 kilos in 1925; and rubber footwear: 549,769 kilos and 484,986 kilos in 1924 and 1925 respectively.

Available data for 1924 indicate that in that year there were 7 rubber factories in Sweden giving employment to 3,066 factory hands and 279 office workers and producing goods to a value of 31,409,266 kronar.

The Rubber Trade in the Far East

Malaya

AMERICAN rubber planting plans are not always viewed with the seriousness that they may merit. There is a tendency to regard most of this as only American "tall-talk." A. W. Still, of the *Straits Times*, wishes Americans would take up planting in earnest. At a recent meeting, he said, in the course of a speech, that he wished Mr. Firestone nothing better and nothing worse than ten years' experience in the wilds of Liberia. He had visions of an old and tottering Firestone who might be made an honorary member of the association and who would then declare from a long and bitter experience that five shillings a pound was too little as the price of rubber.

But the *Malayan Tin and Rubber Journal* quotes the following from *The India Rubber World*:

"America may have been dilatory about getting into the business of large scale production of crude rubber, but unless all signs are misleading when it gets fairly started it will more than make up for lost time. So, too, while it may not be able to ward off the rubber shortage that Secretary Hoover forecasts for 1928-30, it would be in a position to not only measurably limit the lean period but to effectually avert a recurrence of such a great industrial adversity."

And this paragraph calls forth from the Malayan paper the comment that:

"The above statement from such a reliable publication as the one edited by Mr. Henry C. Pearson, F. R. G. S., must be taken seriously—it must be taken to mean that our American friends seriously intend making a big attempt to grow their own rubber."

Such intentions, it further remarks, need not alarm rubber growers, in fact the entry of Americans into the rubber growing industry would be all to the good of the industry. However, it would like to see that Americans, instead of making attempts in the Philippines, Brazil, or even the Dutch East Indies, would turn their attention to Malaya, more particularly to the great undeveloped state of Pahang, and it asks whether the possibilities of this state with its vast areas of jungle have been brought to the attention of Americans or whether they are under the misapprehension that they and their money would not be welcome in British Malaya.

Revision of the Stevenson Scale

As is known, a suggestion has of late been made for the revision of the Stevenson scale which it is claimed is receiving official consideration. This scale provides that if the average price of rubber for any quarter is not less than 1*s* 3*d*, the increase in percentage of release be 5 per cent, if not less than 1*s* 6*d*, 10 per cent, not less than 2*s* 0*d*, 15 per cent. On the other hand if the average for any quarter is below 1*s* 3*d*, the percentage of release to be decreased 5 per cent, if below 1*s* 2*d*, 10 per cent, below 1*s* 1*d*, 15 per cent.

The *Straits Times* tests the action of such a revision as follows:

In the quarter February-April, 1926, the exportable percentage will be 100 of standard. If the price in that quarter falls below an average of 1*s* 3*d*, but not below 1*s* 2*d*, the exportable percentage in the May-July quarter would be 95 of standard.

If the price rises fractionally above 1*s* 3*d* in the May-July quarter, the exportable percentage in the August-October quarter will return to 100.

Therefore a price bordering on 1*s* 3*d* may rule for nine months with no more than a cut of 5 per cent for three months being made. It is even conceivable that market manipulation might keep price at 1*s* 3*d* for a couple of years or more.

The paper in question then suggests the following scale so as to make action upwards and downwards more rapid:

If in any quarter the price falls below 1*s* 6*d*, reduce the exportable by 10 per cent, or by such amount as will bring it to or below 90 per cent of standard.

If in any quarter the price falls below 1*s* 3*d* reduce the exportable by 20 per cent or by such amount as will bring it to or below 80 per cent of standard.

If in any quarter price averages above 1*s* 6*d* raise the exportable by 20 per cent provided such increase does not make the exportable more than 100 of standard.

If in any quarter when the exportable is 100 or above 100 of standard price averages 2*s* 6*d*, raise to 110, if 3*s* raise to 120, if 3*s* 6*d* raise to 130 of standard.

New Planting Companies

As a result of the high prices of rubber a number of new companies have been formed to acquire existing estates, to open up new land or to deal in shares. The *Malayan Tin and Rubber Journal* gives particulars of nineteen such concerns with capitals ranging from £100 to £500,000. Some of these follow:

	Capital	Object
Harwood Rubber Estates, Ltd.	£110,000	To acquire the Harwood rubber estate.
Ledang Rubber Plantations, Ltd.	£400,000	To develop estates comprising 8,640 acres, of which 5,517 acres planted, in Johore.
Balfour Trust, Ltd.	£100	
Avreboo Rubber Co., Ltd.	£1,000	To acquire concessions in Africa, etc.
Johore River Rubber Co., Ltd.	£200,000	
Rubber Operator's Trust Ltd.	£100	To deal in rubber and other produce, to acquire lands, mines, to form, finance and control companies.
Remfield Rubber Estates, Ltd.	£250,000	To acquire Rimbah Sawang, estate in Sumatra and Coalfields Estate, Malaya, to adopt agreements with H. Reside and Rubber Estate Agency, Ltd.
Ipoh Rubber Estates, Ltd.	£100,000	
Jabi Rubber Plantations	£65,000	To acquire 1,280 acres in the state of Kedah.
Jenderak Planting Syndicate.	£20,000	To acquire Jenderak estate in Pahang.
Kulim Rubber Estates, Ltd.	£250,000	To acquire estates with a total area of 3,016 acres, of which 2,563 acres planted, in Kedah.

The acting Registrar of Imports and Exports has issued a series of statistics giving details of the sources of rubber imports at Singapore and Penang during 1925. Summarized the figures, in English tons, are:

	Dry	Wet	Total
Netherlands Indies			
1925	14,412	124,452	138,864
1924	12,289	80,806	93,095
Increase	2,123	43,646	45,769
Sarawak and British North Borneo			
1925	10,352	416	10,768
1924	8,047	327	8,374
Increase	2,305	89	2,394
Indo China, Siam, Burma, Etc.			
1925	3,887	4,504	8,391
1924	3,460	2,490	5,950
Increase	427	2,014	2,441
Totals of All Countries			
1925	28,651	129,372	158,023
1924	23,796	83,623	107,419
Increase	4,855	45,749	50,604

Figures for the exports of rubber from Malaya during January, 1926, show that while total exports were 30,452.15 tons in that month, against 19,183.25 in January, 1925, yielding an increase of 11,268.90 tons, imports of rubber were only 10,237.01 tons in 1926 as compared with 10,131.63 tons in 1925, that is an increase of a little over 100 tons.

The January, 1926, imports are lower than those for any month since February, 1925, when they were slightly over 10,000 tons. It remains to be seen whether imports will regain the level reached during the latter part of 1925 or whether they will remain around the low figure of January, 1926, as many expect they will.

Ceylon

On October 2, 1925, a resolution was passed in the Ceylon Legislative Council stating that since the Secretary of State had sanctioned a maximum flat rate of 500 pounds per acre of rubber in Malaya as from August 1, 1925, the council should request the government to take immediate steps to obtain the sanction of the Secretary of State for a similar flat rate in Ceylon for all rubber estates that are now assessed on a flat rate of 320 pounds per acre.

Effect has now been given to the above resolution and according to the new rule all estates over 10 acres which have hitherto been assessed below 500 pounds per acre will have the opportunity of getting 500 pounds per acre if they can prove productivity to that extent. Estates which on their 1919-20 crop figures were assessed at less than 500 pounds per acre as well as estates at present on a flat rate of 320 pounds per acre will be affected by the new ruling.

According to a representative of the *Times of Ceylon*, G. F. R. Browning, the Ceylon Rubber Controller, said the increase in standard production under the new assessment would be mainly a paper one. Since Ceylon had not been able to export her full quota in recent months, it was hard to see how any considerable increase in her rubber exports could now be looked for.

Control of Rubber Prices

The sag in the rubber market coupled with the 100 per cent release of standard production has caused some anxiety in rubber circles throughout the East and in more than one quarter the year 1926 is regarded as a critical year which will put the strength of producers as against consumers to the test.

People would not like such a test and it is felt by many that something should be done to prevent such a contingency. Hence the frequent expression in various organs regarding the desirability of retaining the Stevenson scheme on the statutes.

Very little is heard of the selling scheme which the Rubber Growers' Association was considering just before the sudden spurt in rubber prices. But in a recent issue of the *Times of Ceylon*, we find an interview with G. Nicol Thomson, who considers that since compulsory restriction has practically come to an end there will be no control of any kind to prevent temporary over-production, which would become a source of strength to the "bears" in depressing prices.

The industry is again facing the danger of overtapping, which would ruin rubber planting as too much rubber would come on the market and in the absence of cooperative selling of some kind consumers would continue a hand-to-mouth buying policy. Then, with no one willing to carry temporary surplus, prices would collapse and cheap forward contracts would be entered into. Besides this, of course, overtapping is bad for the trees, weakening them and exposing them to attacks of disease.

Both from the manufacturer's point of view and that of the consumer, yields of 250 to 300 pounds per acre on an average over several years, and good prices, were preferable to poor prices and high yields, particularly as the high yields could only be obtained at great risk to the whole industry and would only be temporary.

Ceylon Rubber Exports

The total quantity of rubber exported from Ceylon during the year 1925 was 102,361,700 pounds of rubber against 83,666,532 pounds in 1924. The chief countries to which this rubber went in 1925 were: United States, 66,766,051 pounds; Great Britain, 27,214,750 pounds; Australia, 2,007,581 pounds; Germany, 3,768,832; France, 1,326,817 pounds. The 1925 shipments were the largest since 1922 when they totaled 106,102,392 pounds.

Netherlands East Indies

Cooperative Rubber Selling

A local paper takes up the question of cooperative selling of rubber again. It seems that the 100 per cent release as from February 1, 1926, and the sharp drop in prices from the peak it had reached about the end of 1925 have made producers seriously take stock of their position again. The conclusion in certain quarters has been that prospects for the immediate future are not quite as bright as they might be. A big shadow is cast by the action to be expected from America which must have rubber and will not pay excessive prices. The possibility of concerted action from the consumers should be guarded against by a massing together of producers. The paper in question sees no great difficulties ahead as regards the organization of bodies to undertake the central selling.

In Java and South Sumatra owners of rubber estates are united in the Algemeen Landbouw Syndicaat (General Agricultural Syndicate), and in the rest of Sumatra they are combined in the "Avros." The English producers have their own planting associations which are actually regulating prices at present through restriction, so that the planting interests are really ruled by a few associations.

As for the native rubber, this is sent to Singapore to be remilled. Shortly similar factories will arise in the Dutch rubber centers and as a matter of course the factories will cooperate with the planters because it is to their interest to do so. Therefore native rubber will form no obstacle when it comes to centralization.

There is further, no reason why all producers should be organized in one single body. This is not necessary, as individual cooperative-selling groups could be formed which could properly take care of their own territories, so long as all the groups worked together.

Rubber Factory in Djambi

It is learned that a company has been formed in Holland to erect a large factory in Djambi for the purpose of remilling the native rubber produced in that section. At present all this rubber goes to Singapore to be treated there and for some time past the advisability of establishing similar factories on the spot has been considered.

The company, it appears, has a capital of 2,000,000 guilders and a number of prominent Dutchmen are directors. If this venture proves a success it will mean a serious loss to Singapore Chinese, but the high wages now obtained in Djambi and the peculiar nature of the business may work in favor of Singapore so that most of the business may remain there.

BALATA CULTIVATION IN BRITISH GUIANA

Government reports from British Guiana state that during 1924 the area devoted to Pará rubber was reduced to 1,655 acres, this being due to the spread of leaf disease and also to low rubber prices. The report shows, however, a decided advance in the cultivation of balata, 12,234 cwts. being exported during 1924, a gain of 3,070 cwts. as compared with 1923.

The mean rate of growth of the balata trees at the experimental station at Issorora has been slow, the average being 1.85 inches increase in circumference per annum, the maximum rate being 2.62 inches and the minimum 1.17 inches.

Balata trees may therefore take 30 years from planting out for the trees of a group to attain the legal tappable size—a girth of 36 inches at 4 feet 6 inches from the crown of the roots, although about half of them may attain this size in 20 years while the most rapidly growing trees may do so in 14 years.

Rubber Patents, Trade Marks and Designs

The United States

February 9, 1926*

1,571,998 Corset confiner. Effie S. Coleman, Birmingham, Alabama.
1,572,053 Compressed rubber and air cushion for tires. Richard H. Villard, Atlanta, Georgia.
1,572,105 Golf ball tee. Edmund Joseph Byrne, Piccadilly, London, England.
1,572,187 Balloon. James F. Cooper, assignor to The Goodyear Tire & Rubber Co., both of Akron, Ohio.
1,572,270 Toy airplane with elastic catapult. Daniel I. Dwyer, assignor of one-half to Earl A. Smith, both of Dayton, Ohio.
1,572,350 Repeating gun for shooting elastic bands. Fred C. Ecker, Topeka, Kansas.
1,572,383 Ball carrier with endless elastic band. Frederick Onslow Brooke Dennys, Lexham Gardens, London, England.
1,572,527 Golf practise ball. William J. Goldsworthy, San Francisco, California.
1,572,746 Compressible safety ring for pneumatic tires. André Jules Michelin, Paris, France.
1,572,811 Tire filling apparatus. Enrico Re, Camden, New Jersey.
1,572,854 Rubber paving block. Ernest Clark, Rio de Janeiro, Brazil, and Daniel T. Gilmartin, Jr., East Orange, New Jersey.

February 16, 1926*

1,573,076 Aerial toy with elastic cord. Merrill D. Love, Los Angeles, California.
1,573,093 Tennis and other playing balls. Robert Russell, Manchester, and Herbert Broomfield, Stockport, both in England.
1,573,239 Container for bathers. Robert Edward Gilliland, Los Angeles, California.
1,573,291 Siphon. Louis Bianchi, Redding, California.
1,573,299 Shoe. Hugh Bullock, Andover, assignor to Converse Rubber Shoe Co., Malden, both in Massachusetts.
1,573,461 Rubber shoe last. Elmer D. Stone, Framingham, Massachusetts.
1,573,495 Tire valve casing cap. Frank C. Hughes, Chicago, Illinois.
1,573,519 Nursing nipple. Jesse Little, Lakewood, assignor to Davol Rubber Co., Providence, both in Rhode Island.
1,573,581 Tire tool. Roy Rutz, Navarre, Kansas.
1,573,675 Garter. Albert Carlson, Swanton, Vermont.
1,573,699 Fountain pen. William J. Giovannetti, Brooklyn, New York.
1,573,730 Valve attachment. Hubert Mays, Okmulgee, Oklahoma.

February 23, 1926*

1,574,010 Rubber support. James West, Ballston Spa, New York.
1,574,097 Fountain pen. Harry Mitchell Koenig, Milwaukee, Wisconsin.
1,574,105 Rim cut tire clamp. Aaron B. Overholt, Three Rivers, Michigan.
1,574,204 Pressure gage cap. Curtis C. Neal, Marmet, assignor by mesne assignment to Tiregauge Valve Corporation, Charleston, both in West Virginia.
1,574,266 Fountain pen. John C. Wahl, assignor to The Wahl Co., both in Chicago, Illinois.
1,574,277 Tire and rim construction for vehicle wheels. Michael T. Conroy, Akron, assignor of one-half to Henry M. Groue, Cuyahoga Falls, both in Ohio.
1,574,281 Fountain pen. George H. Doyle, Holtsville, New York.
1,574,499 Cushion tire. Thomas C. Marshall, Mount Savage, assignor to Kelly-Springfield Tire Co., Cumberland, both in Maryland.
1,574,505 Hose supporter. Ephraim R. Nablo, Fort Wayne, Indiana.
1,574,611 Tire. Anthony F. Dembek, Brooklyn, New York.
1,574,690 Rubber lined acid container. Eli H. Radabaugh, assignor to The Miller Rubber Co., both of Akron, Ohio.

March 2, 1926*

1,574,773 Waterproof gaiter. Edward R. Wharton, Medford, Massachusetts.
1,574,800 Combination fountain pen. Clyde Duncan, Detroit, Michigan.
1,574,919 Fountain pen. Julian H. Murdock, Boston, assignor to Pollock Pen Co., South Boston, both in Massachusetts.
1,574,929 Fountain pen. Robert T. Pollock, Boston, Massachusetts.
1,574,930 Fountain pen. Robert T. Pollock, Boston, Massachusetts.
1,575,021 Filing device. Peter Van Vlissingen, assignor to Syco Systems Co., both of Chicago, Illinois.
1,575,067 Functioning parts of mineral type detectors using rubber cushion. Leon B. Lambert, Wichita, Kansas.
1,575,251 Headgear employing elastic cushion. Edward Cairns, Montclair, New Jersey.
1,575,255 Swimming garment. Julian Czyzkowski Harrison, New Jersey.
1,575,313 Heel. Edward G. Bloser, Los Angeles, California.
1,575,479 Tire flap. Jules Hauvette-Michelin, New Brunswick, New Jersey.
1,575,509 Reenforced tube lining. John Schwab, Jr., Winnipeg, Manitoba, Canada.
1,575,544 Garter. Everett G. Clements, Washington, District of Columbia.

*Under Rule No. 167 of the United States Patent Office, the issue closes weekly on Thursday, and the patents of that issue bear date as of the fourth Tuesday thereafter.

The Dominion of Canada

February 9, 1926

258,014 Elastic fabric. Kops Brothers, Ltd., Toronto, Ontario, assignee of Waldemar Kops, New York, N. Y., U. S. A.

February 16, 1926

258,168 Expansible armor plate tire protector. Amos A. Wyckoff, Oakland, California, U. S. A.
258,182 Thermal treatment bag. The Canadian Consolidated Rubber Co., Ltd., Montreal, Quebec, assignee of Anton Christoph Eggers, New York, N. Y., U. S. A.

February 23, 1926

258,272 Alarm device for pneumatic tires. Hagbart Sylvester Christophersen, Odense, Denmark.
258,315 Brassière and diaphragm supporter. Victoria Lendresse, New Orleans, Louisiana, U. S. A.
258,324 Attachment for hockey sticks. Joseph Munroe, Ottawa, Ontario.
258,373 Brassière. The Fifth Avenue Corset Co., Inc., assignee of Joseph Leonard, both of Allentown, Pennsylvania, U. S. A.

March 2, 1926

258,488 Rubber cover for storage battery cell. Bruce Ford, Philadelphia, Pennsylvania, U. S. A.
258,603 Pneumatic tire casing. The Goodyear Tire & Rubber Co., assignee of Clifford B. Orr, both of Akron, Ohio.
258,604 Cushion tire. The Goodyear Tire & Rubber Co., assignee of Walter E. Shively, both of Akron, Ohio, U. S. A.
258,606 Corset. The International Corset Co., Aurora, assignee of Rosanna DuFora Ulman, Chicago, both in Illinois, U. S. A.

The United Kingdom

January 27, 1926

243,691 Protecting device at rim. Beaney Rubber Co., Inc., 117 West 46th street, New York, assignee of T. A. Beaney, 70 Parker avenue, Poughkeepsie, both in New York, U. S. A.
243,704* Rubber brushes for washing wheels. Innes Co., T. & G. Building, Elizabeth street, Sydney, Australia.
243,705* Tire jackets and covers. V. C. Baudonnel, Tendon, Vosges, France.
243,731* Cushion tire. S. F. Jebsen, Dagaliveien, Slemdal, near Oslo, Norway.
243,747* Tire bodies and cores. S. Nadel, 40 Argentinierstrasse, Vienna.
243,874 Air cushions. D. Moseley & Sons, Ltd., and R. Moseley, Chapel Field Works, Ardwick, Manchester.
243,890 Pneumatic tire. F. L. Rapson, Ottershaw Park, Chertsey, Surrey.
243,941 Draught and weather excluder. W. A. Brookes, 30, Red Cross street, Wolverhampton.
244,005 Head bands. J. Y. Johnson, 47, Lincoln's Inn Fields, London.
244,010 Puncture preventing device for pneumatic tires. F. Maguin, 5, Schulhausstrasse, Zurich, Switzerland.
244,042* Air cushions. A. Klotz, 76 Lindwurmstrasse, Munich, Germany.
244,071* Insulating covers for cables. M. Sieverts Fabriks Aktiebolag, Sundbyberg, near Stockholm.

February 3, 1926

244,223 Rubber paving slabs. E. Clark and D. T. Gilmartin, both of East Orange, New Jersey, U. S. A.
244,265 Weather excluder. G. Haarnagell, 2 Rue Faidherbe, Courbevoie, Seine, France.
244,284 Electric resistance coatings. M. Koopman, 8, Bodney Mansions, Bodney road, Hackney, London.
244,295 Jug handle. P. Blum, Herford, Westfalen, Germany.
244,307 Universal joints. C. W. Spicer, 1300 Central avenue, Plainfield, and G. L. Tarbox, 53 Hudson street, North Plainfield, both in New Jersey, U. S. A.
244,310 Artificial flowers. D. S. Munn, 3, Tarbet street, Gourock, Renfrewshire.
244,322 Corn plaster. W. J. F. Alexander, N. Browne and M. E. Swan, 232, Goswell road, London.
244,342 Pneumatic and solid tires. Budd Wheel Co., assignee of E. A. Nelson, both of 25th street, Philadelphia, Pennsylvania, U. S. A.
244,362 Conveyers. J. Finlayson, Ararat, Victoria, Australia.
244,390* Tread bands. E. J. Kearns.
244,434* Puncture indicator. H. S. Christophersen, 28 Vestergaden, Odense, Denmark.

Chemical patents will be found on page 17. Machinery and Process patents on pages 23-24

February 10, 1926

244,546 Shoes for animals. S. W. Orr, Ballyminstra, Lisbane Post Office, Co., Down, Ireland.

244,602 Brush with rubber shield. M. Kaye, 46, Panmuir road, Wimbledon, London.

244,636 Door check. A. E. White, 88, Chancery Lane, London (B. F. Goodrich Co., 1780 Broadway, New York, N. Y., U. S. A.).

244,651 Device for inflating twin pneumatic tires. E. C. R. Marks, 57 Lincoln's Inn Fields, London (Budd Wheel Co., 25th street, Philadelphia, Pennsylvania, U. S. A.).

244,752* Vacuum jacketed vessels. A. Keller-Bär, 187, Guterstrasse, Basle, Switzerland.

244,770* Cushion for artificial teeth. R. M. Withycombe, Wyoming, Macquarie street, Sydney, New South Wales.

February 17, 1926

244,856 Nozzle for petrol cans. F. S. Rippingille, Winchester House, Victoria Square, Birmingham.

244,912 Rubber covered studs for athletic footwear. L. Deschamps, 101 Rue Victor Hugo, Le Havre, France.

244,932 Holders for rubber type. A. Phillips, 8, Shoebury road, East Ham, London.

244,934 Boot laces. W. Paton, Ltd., and G. C. Paton, Johnstone Mills, Johnstone, Renfrewshire.

244,943 Printing press with rubber diaphragm. J. Grünberg, 124 Kürfurstenstrasse, and R. Kahnges, 20 Hohenzollernstrasse, both in Berlin, Germany.

244,992 Inhaler. J. Breir, 52 Aachenerstrasse, Dusseldorf, Germany.

245,037 Detachable lining cushion. K. E. Gay, 137, Upper Richmond road, Putney, London.

245,041 Stocking protector. F. W. Slade, 50, St. Paul's road, Bow, London.

245,046 Toy pistol employing elastic band. A. G. Howell, Marston, Burlington road, Swanage, Dorset.

245,054* Artificial teeth with rubber plate. N. S. Essig, 1700 Locust street, Philadelphia, Pennsylvania, U. S. A.

245,085* Heel protector. G. L. Borneff, 28 Kaiser Friedrichstrasse, Altrahlstedt, near Hamburg, assignee of O. Lehmann, 19 Armbruststrasse, Hamburg, both in Germany.

February 24, 1926

245,167* Endless track with rubber tread members. V. Woick, 108 Berliner Strasse, Charlottenburg, Berlin, Germany.

245,230 Accumulator carriers employing rubber tubes. H. C. Lawdham, 342, Baker street, Enfield, London.

245,252 Battery separators. M. Wilderman, 72, Fellows road, Hampstead, London.

245,267 Gloves for swimming. J. McCarthy, 5, Latham road, Irlam, near Manchester, and E. White, 105, Thomson road, Gorton, Manchester.

245,274 Exercising apparatus. W. Scouler, 171, Wolseley street, Glasgow.

245,289 Hose suspenders and sleeve bands. R. M. Smith, Silverside, Bearsden, near Glasgow.

245,302 Windshield with rubber stop. C. H. Bach, 17, Coleshill street, Birmingham.

245,303 Piston rings. E. E. Miller, 129 West Santa Fe avenue, Fullerton, California, U. S. A.

245,339 Door stops. G. Beaton & Son, Ltd., and G. H. Beaton, Victoria road, Willesden, London.

245,356 Tread band. J. M. De Aròstegui E Ybarguen-Goitia, 25 Gran Via, Bilboa, Spain.

245,371 Moistening device. G. W. T. Leeson, Estcourt, Hook Heath, and Sorbo Rubber-Sponge Products, Ltd., Sorbo Works, both in Woking, Surrey.

245,376 Combination garments with elastic insertions. N. Hatch, 662 Madison avenue, Albany, New York, U. S. A.

245,386 Horseshoes. F. G. Hasler, Ty Coch, Trefnant, Denbighshire.

245,387 Braces. E. B. Morgan, 26, Page street, Westminster.

245,399 Tires. G. Fornaca, 7 Via Giannone, Turin, Italy.

245,448* Reservoir pen. Fabrica Italiana Di Penne A Serbatoio Aurora, 9 Via Basilica, Turin, Italy.

*Not yet accepted.

New Zealand

December 31, 1925

52,967 Sheep bearing appliance. William Arthur Taylor, St. George's road, Hastings.

53,951 Saddle. Horace Victor Marr, 223 Walcott street, Mount Lawley, West Australia, nominee of Louis Thomas Marr, 6 Park avenue north, Hornsey, Middlesex, England.

54,839 Spark plug protector. William George Cartwright, Charles Arthur Head and Henry Wallace Ward, all of Commerce street, Whakatane.

55,204 Cricket ball. Game Balls Co., Ltd., Windmill road, Brentford, assignee of George William Beldam, Boston Lodge, Ealing, both in Middlesex, England.

Germany

425,649 (March 15, 1925). Protective metal cover for pneumatic tires. Henry McGill, Canterbury, Australia. Represented by Dr. H. Hederich, Cassel.

Trade Marks

The United States

Two Kinds of Trade Marks Now Being Registered

Under the rules of the United States Patent Office, trade marks registered under the Act of February 20, 1905, are, in general, fanciful and arbitrary marks, while those registered under the Act of March 19, 1920, Section 1 (b), are non-technical, that is, marks consisting of descriptive or geographical matter or mere surnames. To be registered under the later act trade marks must have been used for not less than one year. Marks registered under this act are being published for the first time when registered, any opposition taking the form of an application for cancellation.

February 9, 1926, Act of February 20, 1905

208,784 KONGO KOAT—heavy work shirts having elastic bottom portion. Rice-Stix Dry Goods Co., St. Louis, Missouri.

208,798 Representation of a desert scene and a man standing and looking at a stalled car—tire repair kit. John H. Sherman, doing business as Sherman Manufacturing Co., Houston, Texas.

February 9, 1926, Act of March 19, 1920

208,946 DUNHILL—tires. Fidelity Tire & Rubber Co., Massillon, Ohio.

February 16, 1926, Act of February 20, 1905

208,997 Fanciful oblong containing the words: BEST EVER—bedroom and house slippers of leather, rubber and fabric. The Best-Ever Slipper Co., Inc., Brooklyn, New York.

209,028 IECO—jar rubbers. O. W. Peirce Co., La Fayette, Indiana.

209,035 MARPAGE—garters and suspenders. Martin-Page Co., Middlesboro, Kentucky.

209,040 Representation of two parallel broken lines of black and green color arranged spirally upon the body of the hose—grease pump hose. Goodall Rubber Co., Philadelphia, Pennsylvania.

209,169 Representation of a black square in the center of which is the representation of a cat surrounded by a double circle containing the word: "DEXTER"—rainproof coats, hats and caps. Wallace, Scott & Co., Ltd., Cathcart, Glasgow, Scotland.

209,190 Representation of a black circle with the words: "R. T. VANDERVILT Co., N. Y.," "AMERICAN PRODUCTS" and "SUSSEX WHITING"—whiting. R. T. Vanderbilt Co., Inc., New York, N. Y.

209,219 FLIGHTEX FABRIC—cotton, linen or silk textile fabric treated with rubber. E. S. Twining & Co., New York, N. Y.

209,232 LINERETTE—paper impregnated and coated with nonsticking material for handling uncured rubber. The Cleveland Liner & Manufacturing Co., Cleveland, Ohio.

209,274 MOPECO—fountain pens. The Moore Pen Co., Boston, Massachusetts.

February 23, 1926, Act of February 20, 1905

209,318 In large letters the word: DREDNAUT, above this the word: SUPER, beneath the words: DECK COVERING—textile fabric coated with rubber. L. C. Chase & Co., Boston, Massachusetts.

209,332 The numeral: 8 through the center of which runs a pennant containing the word: RALEIGH—shoes of leather, rubber, fabric, etc. Raleigh Haberdasher, Inc., Washington, District of Columbia.

209,333 A representation of an airship flying high in the air and bearing the words: "AERO LINE" and "ROUND THE WORLD"—rubber and leather shoes. Endicott Johnson Corporation, Endicott, New York.

209,344 EXCEL—rubber heels, soles, shoes and overshoes. Hood Rubber Co., Watertown, Massachusetts.

209,349 GRISINA—breast supports, collars, belts, corsets and hose supporters. Teresina Maria Negri, Paris, France.

March 2, 1926, Act of February 20, 1905

209,768 NU-LASTIC—narrow elastic fabrics. Townsend Manufacturing Co., Harfield, Pennsylvania.

209,835 JUPA—rubber combs, etc. Julius Pauly, Inc., New York, N. Y.

209,863 VALCLAR—rubber toilet kits and traveling cases. Kase-Quinby Rubber Co., Inc., New York, N. Y.

209,879 "DURO-BROCAID"—bathing caps and rubber household aprons. The Seamless Rubber Co., Inc., New Haven, Connecticut.

209,900 RUBBERLAC—rubber lacquer. Joseph W. Pearson, Los Angeles, California.

209,909 "PROTEX"—sanitary belts, aprons, bloomers, rubber baby pants, hot water bottles and fountain syringes. The Fair, Chicago, Illinois.

209,915 TRU WEAR—gloves, raincoats, etc. David Rothschild & Co., Columbus, Georgia.

209,921 Representation of a square part of which is black, the center containing a large numeral: 4, and the four black triangles containing the words: "FOUR," "POINT," "GLOVES" and the letters: "NG"—rubber, leather and fabric gloves. Arch L. Cook, doing business as Great Northern Glove Co., Bluffton, Indiana.

March 2, 1926, Act of March 19, 1920

209,984 ANNETTE KELLERMANN—bathing caps, etc. The Asbury Mills, New York, N. Y.

209,986 MADISON—narrow elastic web. C. J. Haley & Co., Inc., New York, N. Y.

The Dominion of Canada

Registered

February 16, 1926

39,207 Words: "KORECT AIR" underlined by a line joining the tails of the "K" in "KORECT" and the "R" in "AIR"—combined air line nozzles and air pressure gages for air lines in automobile service stations and individual air pressure gages for tires. Hall-Daw Manufacturing Co., Buffalo, New York.

39,209 Representation of a girl holding her hat with her right hand, and one edge of her coat with the other, and wearing red garters; the words: "GUARANTEED 1 GROSS MERCERIZED ELASTIC," "INCH" and "FINEST QUALITY" in green; also the word, letters and numerals: "No. A-1"; the whole appearing on a yellow background and enclosed by two green concentric circles—elastic web and shoe laces. Rhode Island Web Co., Pawtucket, Rhode Island, U. S. A.

39,220 Word: "JELCO"—druggists' sundries. Johnson & Johnson, Ltd., Montreal, Quebec.

March 2, 1926

39,321 Words: "NATIONAL SEALTITE"—jar rubber rings, etc. National Grocers Co., Ltd., Toronto, Ontario.

39,341 Word: "JIFFY"—suspensory and other bandages and supports. Johnson & Johnson, Ltd., Montreal, Quebec.

The United Kingdom

January 27, 1926

462,497 FATURAN—goods manufactured from india rubber and gutta percha. Heinrich Otto Traun, trading as Dr. Heinr. Traun & Söhne Vormals Harburger Gummi Kamm Co., 59, Meyerstrasse, Hamburg 8, Germany.

463,004 STORM KING—overcoats and raincoats. Charles Baker & Co., Ltd., 137, Tottenham Court, London, W. 1.

463,631 BIRDIE—golf balls. St. Mungo Manufacturing Co., Ltd., 185 Broomloan road, Glasgow.

464,662 ROBERPILE—goods manufactured from india rubber and gutta percha. Herbert Alexander & Co., Ltd., Huddersfield road, Roberttown, Liversedge, Yorkshire.

465,282 RANGE FINDER—golf balls, etc. Donaldson Manufacturing Co., Ltd., 1a, Blythswood Square, Glasgow.

465,358 TANGO—goods manufactured from india rubber and gutta percha. The Beldam Packing & Rubber Co., Ltd., 29, Gracechurch street, London, E. C. 3.

465,610 WANDAMAC—rainproof and waterproof garments. Joshua Abrahams, trading as The Standard Weathercoat Co., Standard Works, Lyte street, Cambridge Heath, London, E. 2.

February 3, 1926

462,052 GRIFFIN—goods manufacturer from india rubber and gutta percha, not including elastic fabrics, tissues, etc. Heinrich Otto Traun, trading as Dr. Heinr. Traun & Söhne Vormals Harburger Gummi Kamm Co., 59, Meyerstrasse, Hamburg 8, Germany.

463,896 Representation of a pair of suspenders with the word: "SUPERPAT" encircling them, above this representation the words: "LA SUPERPAT" and "TOUT CAOUTCHOUC"—braces and suspenders. Société C. Darnon, 9, Rue William-Neyrand, St.-Chamond, Loire, France. Herbert Haddan & Co., 31 Bedford street, Strand, London, W. C. 2.

465,060 Representation of a square one side of which contains the representation of a house whose foundation are the letters: VD, the other half of the square holds the words: "THE VERI-DRI RAINCOAT, POROUS, HYGIENIC SHOWERPROOF"—raincoats. Jonathan Shaw & Bros., Ltd., 18, Park Place, Leeds, Yorkshire.

465,555 PEDIGREE—braces, belts and suspenders. Taylor Bros. Brace Co., Ltd., 76, Great Bridgewater street, Manchester.

February 10, 1926

459,256 RUNWELL—tires and tubes. The Runwell Cycle Co. (Birmingham), Ltd., 24, Lawson street, Birmingham.

February 17, 1926

465,635 MULTIPED—tubular hose. Gutta Percha & Rubber, Ltd., 47, Yonge street, Toronto, Canada.

February 24, 1926

454,879 ANCAFLEX—rubber insulated electric cables. Callenders Cable & Construction Co., Ltd., Hamilton House, Victoria Embankment, London, E. C. 4.

454,880 ANKAFLEX—rubber insulated electric cables. Callenders Cable & Construction Co., Ltd., Hamilton House, Victoria Embankment, London, E. C. 4.

New Zealand

December 31, 1925

B20,572 LIFETIME—fountain pens. W. A. Sheaffer Pen Co., Fort Madison, Iowa.

23,196 Shield containing the letter: "S," beneath which is the word: "KEYSTONE"—boots and shoes of leather, rubber and fabric, etc. S. Stone & Co., Ltd., Queen and Darby streets, Auckland.

Designs

The United States

69,440 Shoe sole. Term 14 years. Frank E. Church, Scarsdale, New York, assignor to National India Rubber Co., Bristol, Rhode Island.

69,441 Shoe sole. Term 14 years. Frank E. Church, Scarsdale, New York, assignor to National India Rubber Co., Bristol, Rhode Island.

69,495 Tire. Term 14 years. Asa B. Cooley, Hubbard Woods, assignor to Montgomery Ward & Co., Inc., Chicago, both in Illinois.

69,496 Tires. Term 14 years. Asa B. Cooley, Hubbard Woods, assignor to Montgomery Ward & Co., Inc., Chicago, both in Illinois.

69,497 Tire. Term 14 years. Asa B. Cooley, Hubbard Woods, assignor to Montgomery Ward & Co., Inc., Chicago, both in Illinois.

69,499 Fountain pen. Term 3½ years. David L. Davis, assignor to W. A. Sheaffer Pen Co., both of Fort Madison, Iowa.

69,507 Resilient tire. Term 14 years. Wade S. Galvin, assignor to The Akron Standard Mold Co., both of Akron, Ohio.

69,575 Overshoe. Term 3½ years. Chester A. Emerson, Wakefield, assignor to Converse Rubber Shoe Co., Malden, both in Massachusetts.

The Dominion of Canada

7,039 Shoe soles. Canadian Consolidated Rubber Co., Ltd., Montreal, Quebec.

7,040 Shoe soles. Canadian Consolidated Rubber Co., Ltd., Montreal, Quebec.

Germany

933,473 (December 1, 1925). Small electric vulcanizing apparatus. Heinrich Bergmann, Lillistrasse 13, Offenbach-am-Main.

933,519 (November 27, 1925). Device for perforating rubber nipples. Gustav Dolze, Jun., Grassau, Oberbay.

933,550 (December 3, 1925). Air cushion. Carl Greber, Darmbach, Thuringia.

933,813 (November 30, 1925). Pocket cudgel of rubber. Karl Will, Mittelseestrasse 50, Offenbach-am-Main.

933,835 (December 7, 1925). Hollow rubber profile tire for head felloes of small vehicles. Grahneis & Börner, Zipsendorf, Bez. Leipzig.

934,436 (November 9, 1925). Rubber coat. Georg Götz, Bayrischestrasse 40, Leipzig.

934,448 (November 23, 1925). Transmission belt of rubber mixed with vegetable fiber. Wilhelm Römer, Sandtorstrasse 6, Magdeburg.

934,486 (December 12, 1925). Vulcanizing mold. A.-G., Metzeler & Co., Munich.

935,407 (December 23, 1925). Rubber handle for baby and doll carriages. E. A. Naether A.-G., Zeitz.

936,427 (December 5, 1925). Lamp shade of rubber for small electric pictures and toys. Martha Marie Herrmann, née Hessling, Gniebsdorf, near Bürgel, Thuringia.

936,576 (December 23, 1925). Rubber heel that can be attached without nails or gum. Salomon Schureck, Steinstrasse 59, Düsseldorf.

936,679 (May 7, 1925). Rubber goods, particularly for hygienic purposes. Vulkan Gummiwarenfabrik Weiss & Baessler, Leipzig-Lindenau.

936,789 (January 12, 1926). Rubber coat. Walter Krause, Inselnerstrasse 1, Magdeburg.

936,815 (November 2, 1925). Rubber cushion for ladders. Ludwig Sedlmayer, Schlegelstrasse 20, Köln-Lindenthal.

936,975 (December 11, 1925). Air cushion. Zieger & Wiegand, A.-G., Leipzig-Volkmarsdorf.

937,001 (November 20, 1925). Seat for vehicle saddle made of braided rubber cords. Firma Josef Klein, Frankfurt-am-Main.

937,541 (November 27, 1925). Footwear with rubber lining in the counters. Walter Albrecht, Breite Weg 130-131, Magdeburg.

937,794 (May 15, 1925). Gas-filled ball. Harburger Gummiwarenfabrik Phœnix A.-G., Harburg a. d. E.

937,841 (January 18, 1926). Rubberized shoe sole. Albert Borbo, Hardt b. Schramberg, Wurtt.

938,082 (August 25, 1925). Supported and protected rubber sole. Fritz Griessel, Radeberg i. Sa.

938,145 (November 6, 1924). Elastic body of sponge rubber with soft rubber cover. Friedrich Wilop, Mönckebergstrasse 7, Hamburg.

938,599 (January 26, 1926). Soft rubber comforter filled with air, liquid or jelly. Hatu Gummiwerke Hartmann & Tuphorn, G. m. b. H., Erfurt.

938,685 (June 22, 1925). Hard rubber earphone with superimposed soft-rubber rim. Dr. Heinrich Traun & Söhne vorm. Harburger Gummi-Kamm Co., Hamburg.

Prints

The United States

8,603 Pathfinder Tire. Tires. The Goodyear Tire & Rubber Co., Inc., Akron, Ohio.

A Review of Crude Rubber in 1925*

Production and Consumption—World Stocks—Plantation Acreage—Forecast for 1926-1931

By Richard Hoadley Tingley

A REVIEW of the crude rubber industry for 1925 emphasizes the fact that, in many respects, it has been the most phenomenal year the trade has ever witnessed. In what follows the writer has endeavored to bring out the salient facts that have contributed toward making this an extraordinary year and, as a matter of record, to show the statistical position in which rubber found itself at the close of 1925.

Production

World production, despite restriction, increased over that of the previous year by a larger percentage than in any other single year except 1922, and is the largest yearly production on record. Every rubber producing country participated in this increase, as will be seen by the following table:

TABLE I

WORLD PRODUCTION OF CRUDE RUBBER

	1924 Long Tons	1925 Long Tons
Malaya	165,000	198,000
Ceylon	37,000	42,000
Dutch East Indies	162,000	190,000
British India	7,200	9,000
British Borneo	4,500	6,000
Indo China	6,400	7,000
Sarawak	3,900	5,000
Other Plantations	4,500	6,000
Brazil	23,500	28,500
Wild	6,000	8,500
Total	420,000	500,000

Analysis of Production

In arriving at the net production from Malaya, the gross exports are taken at 316,825 tons. Foreign imports were 158,000 tons, of which about 130,000 tons were wet native rubber. Allowing 30 per cent (39,000 tons) for moisture and dirt, the net figure of 119,000 tons of foreign import is arrived at which, deducted from the gross export, shows 197,825 tons net export from Malaya, the round number used in Table I being 198,000 tons.

Gross shipments from Ceylon amounted to 45,628 tons, of which about 3,700 were reexports. With a net figure of 41,928 tons (called 42,000 tons in Table I), Ceylon shows an export of 2,000 tons less than her exportable quota, which works out to 44,090 tons.

The Department of Agriculture, Industry and Commerce of the Dutch East Indies has compiled some elaborate data bearing on the allowance which should be made for moisture and dirt in her native rubber. From these figures it appears that an average deduction of 35 per cent has to be made from her total exports of native rubber,—(only 7 per cent of which is shipped clean and dry)—in order to arrive at the net dry rubber content. Taking all factors into account the total Dutch production in 1925 figures out as follows: Estate rubber, 110,000 tons; native rubber (dry, clean equivalent), 80,000 tons; total, 190,000 tons.

Analysis of Consumption

According to figures of the Rubber Association of America the United States consumed 384,645 tons in 1925. Official government figures to the end of November show a net import for eleven months of 343,648 tons. Unofficial reports give December arrivals of 39,519 tons. Allowing 1,119 tons for December exports a net import figure of 382,048 tons is arrived at. Stocks at the end of 1925, being 6,732 tons less than the year before, indicate a net total consumption of 388,780 tons.

In the United Kingdom the deliveries arrived at by calculating imports and exports and decrease in stocks amount to 30,188 tons, the figure used in Table II being 30,000 tons; an increase of 3,000 tons over 1924.

France retained 33,000 tons in the first eleven months of 1925, her estimated consumption for the entire year being 36,000 tons, an increase of 1,000 tons over the year before.

Similarly the German and Austrian consumption is based on eleven months actual rubber retained, estimated at 37,000 tons, an increase of 14,500 tons (64½ per cent) over the previous year.

Russian consumption is merely an estimate; 7,084 tons are known to have been imported from Great Britain, and unknown quantities from Holland.

Consumption

World consumption in 1925 overtopped that of the year before. Every country in the world, except Japan, Australia and Holland, contributed its share to this added consumption as appears in the subjoined table:

TABLE II

WORLD CONSUMPTION OF CRUDE RUBBER

	1924 Long Tons	1925 Long Tons
U. S. A.	335,000	386,000
United Kingdom	27,000	30,000
France	35,000	36,000
Italy	8,700	11,000
Spain	2,000	2,500
Canada	14,500	17,000
Australia	3,500	2,500
Japan	17,000	13,000
Germany and Austria	22,500	37,000
Russia	2,000	9,000
Scandinavia	2,800	3,000
Belgium and Holland	3,000	3,000
Other Countries	2,000	2,000
Total	475,000	552,000

Stocks

Stocks of rubber at the end of the year 1925 were the smallest ever recorded, being lower than the previous year. The distribution of these stocks is shown in the following table:

TABLE III

WORLD STOCKS OF RUBBER AT THE END OF THE YEAR

	1924 Long Tons	1925 Long Tons
Singapore	16,000	16,000
Penang	3,000	2,000
Malaya	12,000	8,000
Ceylon	2,500	3,000
Dutch East Indies	12,000	6,000
United Kingdom		
Public warehouses	32,400	6,250
Private warehouses	2,600	1,250
U. S. A.		
Manufacturers	47,000	41,400
Dealers	10,700	9,600
Pará and Manãos	2,000	1,000
Continental Ports	800	500
Afloat	58,000	56,000
Total	199,000	151,000

With but a slight increase in December, 1925, over the previous month, stocks of rubber held in the United Kingdom decreased almost to the vanishing point, each month's record showing but a fraction of the holding noted in the corresponding month of 1924, or of any other year.

*Abstracted from the report of Symington & Sinclair, London, England.

TABLE IV

Stocks of Rubber in the United Kingdom at the End of the Month

	1924 Long Tons	1925 Long Tons
January	63,561	29,899
February	62,579	25,636
March	61,335	19,891
April	60,440	14,164
May	56,643	6,534
June	55,985	5,707
July	56,684	4,561
August	54,218	4,948
September	47,994	6,078
October	40,868	5,750
November	36,630	4,531
December	32,376	6,250

Similarly, United States stocks held at the year-ends dwindled each year since 1921:

TABLE V

Stocks of Rubber in the United States at the End of the Year

	Manufacturers Long Tons	Dealers Long Tons	Total Long Tons
1921	72,263	27,494	99,757
1922	75,678	18,805	94,483
1923	56,523	20,234	76,757
1924	47,010	10,707	57,717
1925	41,366	9,619	50,985

Prices

The last outstanding feature in the record of 1925 is the phenomenal divergence in the price-range, from a low of 34¼ cents in January, to a high of $1.23 in July, this being the highest price reached since 1912.

Restriction

The quarterly average prices from February, 1925, to January, 1926, worked out as follows:

	s d
February-April, 1925	1-7.356
May-July	3-2.469
August-October	3-7.265
November, 1925—January, 1926	3-10.709

Automatic extra releases of 10 per cent have therefore taken place, and the average exportable quota for 1925 works out as anticipated at 67 per cent of standard production. Starting from 55 per cent on February 1, 85 per cent was reached on November 1, and on February 1, 1926, the quota was raised to 100 per cent.

Production Per Acre

The average Malayan yield per acre is placed at 336 pounds, though some estates run as high as 500 pounds with a few rare instances of 800 pounds. The Ceylon yield is placed at the same figure—336 pounds—and Burmah and Southern India at 224 pounds. From statistics supplied by the Dutch East Indian Government the average Dutch yield is placed at 355 pounds per acre.

Figart, in his report to the United States Department of Commerce, states that the average of 24 estimates from well-informed people of the potential unrestricted output in Malaya, including British and native owned estates, comes out at 324 pounds per acre. Taking standard production in Malaya at 280,000 tons, with an area of approximately 1,900,000 acres in bearing, we arrive at an average of 330 pounds per acre.

Forecast for 1926

Regarding production for 1926 the total acreage which will be in bearing in 1925 is estimated as follows:

TABLE VI

Acreage Estimate for 1926

	European Acres	Native Acres
Malaya	1,250,000	700,000
Ceylon (Including native)	425,000	.....
Dutch East Indies	750,000	.....
Other Eastern plantings	240,000	100,000
Total	2,665,000	800,000

The Dutch East Indies native plantings cannot be measured in acres, but fairly reliable estimates of output are available.

The previous estimates therefore work out as follows:

TABLE VII

Rubber Production—1926

		Long Tons
Malaya		
1,250,000 Estate acres	@ 350 lbs.	195,000
700,000 "Native" acres	@ 280 lbs.	88,000
Total Malayan		283,000
Ceylon		
425,000 Estate and Native acres	@ 336 lbs.	64,000
Dutch East Indies		
750,000 Estate acres	@ 336 lbs.	112,500
Native output (dry)	(as above)	87,000
Other Planted Areas		
240,000 Estate acres	@ 252 lbs.	27,000
100,000 Native acres	@ 224 lbs.	10,000
Total eastern rubber		583,500
Para grades		32,500
Wild rubber		10,000
Total for 1926		626,000

The following table summarizes the forecast for 1926:

TABLE VIII

Production Forecast—1926

	Long Tons
Malaya	283,000
Ceylon	64,000
Dutch East Indies	199,500
British India	10,000
British Borneo	7,000
Indo China	7,500
Sarawak	5,500
Other Plantations	7,000
Brazil	32,500
Wild	10,000
Total	626,000

TABLE IX

Consumption Forecast—1926

	Long Tons
U. S. A.	415,000
United Kingdom	33,000
France	37,500
Italy	12,000
Spain	2,500
Canada	20,000
Australia	3,000
Japan	15,000
Germany and Austria	45,000
Russia	12,000
Scandinavia	3,000
Belgium and Holland	3,000
Other Countries	2,000
Total	603,000

Potential Production and Consumption—1926-1931

The total planted area of estates under rubber at the end of 1925 was approximately 3,120,000 acres, divided as follows:

TABLE X

	Acres
Malaya	1,400,000
Dutch East Indies	1,000,000
Ceylon	420,000
Others	300,000
Total	3,120,000

Excluding the native cultivation of the Dutch East Indies, which is not measurable in acres, there are approximately a further million acres under cultivation by natives. We may take this acreage as roughly representing the producing area for the year 1931, and if we calculate on an all round output of 336 pounds per estate acre, and 280 pounds per native acre, we get a total yield in that year from these sources of about 590,000 tons.

Dr. A. A. L. Rutgers estimates that the Dutch East Indies native output will, by the year 1930, amount to 150,000 tons of dry rubber. He states that the rise in 1926-1927 will be slight, but that the rise in 1928-1930 is apt to be heavy. This may, however, be altered if prices remain high, in which case overtapping will cause a rapid increase in 1926-1927, with a consequent slowing down in the rate of increase in 1928-1930. We have taken Dr. Rutgers' estimate for 1930 as approximately applying to 1931, though planting in the meantime may make for increased output in 1931.

We would, therefore, tabulate the probable supply in 1931 as follows:

TABLE XI

PRODUCTION FORECAST FOR 1931

	Long Tons
From Estates plantings in the East	465,000
From Native plantings in the East	125,000
From Dutch East Indies, native	150,000
From Brazil and wild rubber	60,000
Probable world output, 1931	800,000

Progressive annual additions of 5 per cent on a figure of 626,000 tons for 1926, gives the following table:

1927	657,000
1928	690,000
1929	725,000
1930	762,000
1931	800,000

"If these figures are anything like correct," declare Symington & Sinclair, "the various American planting projects in Liberia, the Philippines and elsewhere will all be justified, for it will be at least 1931 before these ventures commence to yield any appreciable supply of rubber. A period of scarcity seems indicated to commence in 1928, or even in 1927, if consumption increases at the rate of more than 10 per cent."

Reclaimed as a Substitute for New Rubber

The recent range of high prices for crude rubber stimulated rubber manufacturers in all lines to seek relief by every available means. This need was particularly urgent in the case of the tire and tube branch of the industry, in which by far the bulk of crude rubber is used. The most effective means for crude rubber conservation is by substitution of reclaimed rubber. The advisability of doing this has caused more or less controversy on the part of some tire manufacturers who seem to doubt the possibility of displacing crude rubber in their products, except to a very limited extent, without decreasing their wearing quality.

One important tire manufacturer publicly asserted his belief recently that the real and only practicable way of conserving the crude rubber supply is by putting more new rubber into tires to make them wear longer rather than using any reclaimed rubber as a substitute. Controverting this belief, L. J. Plumb, president of the United States Rubber Reclaiming Co., New York, N. Y., calls attention in the press to the fact that there has been an increased production of reclaim by the larger reclaiming companies and big tire companies and that the latter are very heavy buyers of scrap rubber. He holds that these makers of tires which have borne excellent reputations would not use large amounts of reclaim to the detriment of their product.

Mr. Plumb offers the following figures in substantiation of the possibilities of using reclaim in tires in partial displacement of crude rubber:

"The average run of tires, however, have approximately 10 pounds of crude. Two pounds of rubber at 60c a pound will buy from 11 to 12 pounds of high quality reclaimed rubber, which in turn will yield from 6½ to 6¾ pounds of a good live resilient rubber. Therefore, without increasing his cost, the tire manufacturer could produce a small size tire containing a total of 10¼ pounds of rubber, as against the present six pounds. On the average run of tires such a policy would mean the presence of approximately 17½ pounds total of rubber as against 10. If, on the other hand, the tire manufacturer is compelled to reduce costs, he can do so through the removal of part of the crude rubber and a substitution in its place of a high quality properly made reclaimed rubber, and obtain excellent results. This has been demonstrated time and again through the successful use of millions of tires so made.

"We have had direct experience with tire, tread, friction and sidewall compounds, containing substantial quantities of reclaimed rubber. We have seen these tires stand up and give mile for mile service with many of the so-called standard tires on the same car. The manufacturing data of these tires is at the disposal of any tire manufacturer who cares to have it."

The assertion that the tire manufacturer using reclaim can have no proper control over the uniformity of the stocks used in his product has been effectively disproved by Bierer and Davis in their paper on "The Economical Use of Reclaimed Rubber as a Substitute for New Rubber," read at the meeting of the Rubber Division, American Chemical Society, held February 21-22 at Akron, Ohio.

Waste Material Dealers' Association Holds Annual Convention

The thirteenth annual meeting of the National Association of Waste Material Dealers, Inc., was held March 15-17 at the Hotel Astor, New York, N. Y. At a meeting of the board of directors Egmont L. Frankel was reelected president, while the following directors were chosen for a two-year term:

Louis Birkenstein, S. Birkenstein & Sons, Inc., Chicago, Illinois; James Rosenberg, Marx Maier Paper Mill Supply Corporation, New York, N. Y.; Henry Lissberger, Federated Metals Corporation, New York, N. Y.; G. H. Rady, E. J. Keller Co., Inc., New York, N. Y.; John A. Murphy, Daniel I. Murphy, Inc., Philadelphia, Pennsylvania; R. W. Phillips, E. I. duPont de Nemours & Co., Wilmington, Delaware; H. H. Cummings, Wm. H. Cummings & Sons, New York, N. Y.; Albert T. Hicks, Daniel M. Hicks, Inc., New York, N. Y.; Herman Muehlstein, H. Muehlstein & Co., Inc., New York, N. Y.; Ivan Reitler, Federated Metals Corporation, Chicago, Illinois; Nat C. Myers, Myers-Lipman Wool Stock Company, Inc., New York, N. Y.; Robert Johnston, Jr., General Paper Stock Company, St. Louis, Missouri; S. C. Weber, S. C. Weber Iron & Steel Company, Chattanooga, Tennessee; George B. Doane, Perry, Buxton, Doane Co. of Boston, Massachusetts; Henry Levitt, Michigan Smelting & Refining Co., Detroit, Michigan. Isaac Marx, of A. Marx & Sons, Inc., New Orleans, Louisiana, was elected a director for one year to fill the unexpired term of Walter Schoenbach, resigned.

The Scrap Rubber Division during sessions on March 15 and 16 discussed matters of particular interest, including packing specifications, the question of what constituted a carload, inner tube specifications, and the matter of classifying heels for boots and shoes. It was recommended that a carload shall consist of 15 tons and further: "A carload unless otherwise designated shall consist of the weight governing the minimum carload weight at the lowest carload rate of freight in the territory in which the seller is located. If destination of material requires a greater carload minimum weight, buyer must so specify."

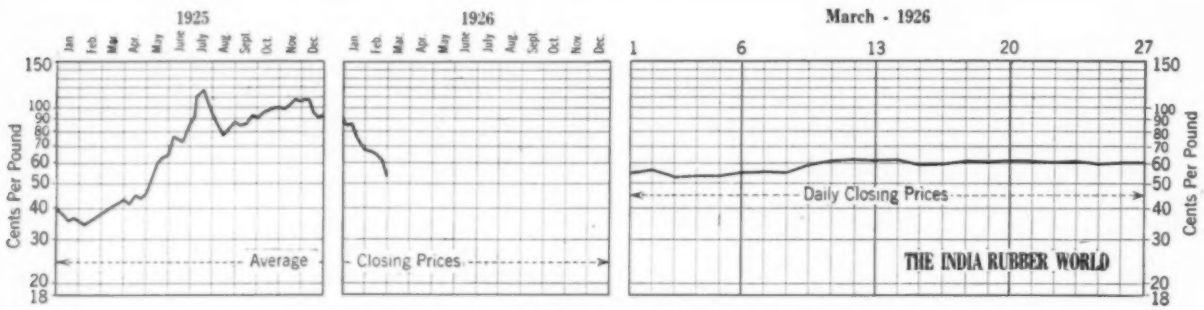
Mixed Inner Tubes: "To be free of crusty, puncture proof and filled tubes, not to contain more than 20 per cent of red tubes."

Colored Rubber Boots and Shoes: "Must consist of red, white and tan, and fancy colors and rubber boots and shoes with colored soles and heels and must be packed and sold separately. The grading and packing to conform to Article 1."

E. B. Friedlander was reelected chairman of the Scrap Rubber Division for another year.

On the evening of March 16 the Association's annual banquet took place, nearly 625 members and guests being present.

AUSTRIA'S EXPORTS DURING THE FIRST SIX MONTHS OF 1925 OF rubber footwear and rubber heels and soles are listed separately by the Department of Commerce as totaling respectively 79,100 and 308,700 kilos (one kilo equals 2.2 pounds). The leading markets for rubber footwear were British India and Turkey, while Poland far outstripped other countries as a customer for rubber heels and soles, taking 105,100 kilos, Italy following with 65,800 kilos.



Ratio Graph of New York Closing Prices of Spot Ribbed Smoked Sheets

Review of the Crude Rubber Market

New York

THE rubber market throughout March presented much the same dullness as in February. Consuming demand has been very limited and scattering. Speculative conditions have prevailed both in New York and London and prices have ruled steadily strong, guided by strong London interests. Factory buying interest is limited to small scattered lots needed for current requirements. It is believed that buying activity will develop soon after April 1 when enlarged tire making schedules will be in force. Manufacturers are holding large inventories of tires which will pass into the hands of dealers as warmer weather arrives. Until then rubber companies will continue to set forward their commitments by reselling their spring futures for those of later date. It is anticipated that about April 1 the smaller factories will begin to buy for May-June needs and the larger ones for July-September.

The first week in March showed very weak and nervous conditions. Only scant buying and factories offering to sell on every advance. Trading in general proved dull. In response to speculative advances in London spot ribs advanced over the previous week's prices. On March 2 spot was 56 cents buyers, 56½ cents sellers. These prices declined sharply the following day but the level was regained, the week closing with spot ribs March 6 at 55 cents buyers, 56 cents sellers.

The second week in March rubber was rather firm, most of the support coming from the dealers. Publication of the figures by the Rubber Association of America showing large crude rubber consumption in February stiffened the market and caused a rapid rise in prices. Business, however, was mostly on the rubber exchange with dealers and consumers as observers only. March 8 spot ribs were 56 cents buyers, 56½ cents sellers, advancing on March 13 to 62 cents buyers, 63 cents sellers.

The third week witnessed very little change in spot prices. The fluctuations closely followed those in London. There was little local trading and practically no factory buying. A rumor gained currency that rubber prices are pegged in London by gentlemen's agreement at around 30*d*. The market is certainly supported by strong influences in the practical absence of demand.

On March 15 spot ribs were 61 cents buyers, 62 cents sellers and on March 27, 59 cents buyers, 59½ cents sellers. Throughout the month spot first latex crêpe maintained a premium of 1 to 1½ cents over ribbed smoked sheets.

Importations of all grades in February were 34,067 tons, compared with 23,456 tons one year ago. Plantation arrivals for February were 31,832 tons, compared with 21,740 tons one year ago. Total importations of plantation rubber for two months ended February 28, 1926, were 68,204 tons, compared with 50,220 tons for the corresponding period of 1925. Total importations of all grades of rubber for the two months ended February 28, 1926, were 72,764 tons, compared with 53,416 tons for the corresponding period of 1925.

The Rubber Exchange of New York

On the New York Rubber Exchange the prices for futures in all positions advanced sharply March 2, the increase on most of the positions being from 2.5 to 2.7 cents. March and April advanced 3.7 and 3.2 cents respectively while December and January each advanced 3.5 cents. The reaction March 3 lowered all positions to below the levels of March 1. March 10 another and stronger upward movement took place reaching prices which have since been well maintained for all positions as shown in the table on the next page. The tone of the exchange market from March 1 to the 27th was firm, strong and steady except on the 16th when it was weak. There were 3,074 contracts sold March 1 to 25 equivalent to 7,685 tons.

London

The month began with prices buoyant and advancing, but immediately followed by a decline due to speculative liquidation. This decline was from 29½*d* to 26¾*d* but partially recovered on March

New York Spot Closing Rubber Prices

Prices in Cents, Per Pound

PLANTATIONS	February, 1926											March, 1926										
Sheet	15	16	17	18	19	20	22*	23	24	25	26	27	1	2	3	4	5	6	8	9	10	11	12	13
Ribbed smoked	63¼	60¼	60¼	60¼	58¾	58¾	....	56½	54¾	51¾	51	51¾	55¼	56¾	53¼	54	54	55¾	56¾	55¾	59¾	60¾	62¼	61¾
Crêpe																								
First Latex	64¾	61¾	61¾	61½	60¼	60	....	57¾	56	52¼	52¼	52½	56¾	58¾	54¾	55	55¼	57	57¾	57	60¼	62	63½	62½
No. 2 blanket	61¼	58¾	59	58½	57¼	57¾	....	55½	53	49½	49	49	52½	54¼	51¾	52½	52¾	53¾	53¾	54	55¾	57½	59¼	58½
No. 3 blanket	60¾	57¾	58	57½	56½	56¾	....	54¾	52	48½	48	48	51¼	53¼	51	51½	51¾	52¾	52¾	53	54½	56¼	58	57½
No. 4 blanket	59	56½	57	56¾	55½	55¾	....	53½	51¼	47½	47	47	50½	52¼	50	50½	50½	51¾	51¾	51¾	53½	55¼	56¾	56½
Thin clean brown	60½	57¾	57¾	57½	56½	56¼	....	54½	51½	48¾	48	48	51½	53	50¾	51¾	51½	52½	51¾	52¾	54¾	56½	58	57
Rolled brown	57	54¾	54½	53	52¾	52¾	....	51¼	48¼	45½	45	45½	48	50½	48	48½	48¾	48¾	48¼	49½	52	53¼	54¾	54½
Off Latex	63½	61¾	61¾	61½	60¼	60	....	56½	55	51¼	51¼	51½	56	57½	53¼	54	53¾	56	56¾	56¾	58¼	61	62	61

* Holiday.

6th to 28½*d* owing to good trade support. In the week from the 8th to the 13th the prices were very irregular. A firm advance carried the price to 29*d* at mid-week and in renewed activity two days later it rose to 30¼*d*.

Speculation based on outlook for increased American demand maintained prices in the week from the 15th to the 20th at practically 30¼*d* all the week. There was practically no factory buying support. Speculative conditions marked the following week maintaining prices from 29½ to 30½*d*.

London stocks gained each week during the month, except that reported March 22 which showed a small decline from the stock of the week previous. The weekly record was as follows: March 1, 9,806 tons; March 8, 10,496 tons; March 15, 11,661 tons; March 22, 11,127 tons.

Preliminary reports of production by 154 Malayan and 32 Ceylon plantation companies show a total output for February of 8,967,576 pounds as compared with 11,432,151 pounds for January, 1926. These figures indicate an output considerably below 100 per cent of standard.

Singapore

The market in Singapore reflected closely the conditions prevailing in London. Prices were irregular with strong upward tendency. Speculative conditions, as a rule, prevailed. Prices were firm except for a brief weakness March 9 due to heavy oriental and native selling. Futures held firm and active. Poor auction attendance was reported on the 24th. Closing prices at the beginning of each week were as follows: March 1, 24½*d*; March 8, 27⅞*d*; March 15, 28⅞*d*; March 22, 29¾*d*.

New York Quotations

Following are the New York spot and future rubber quotations, for one year ago, one month ago, and March 25, the current date:

Plantation Hevea	March 24, 1925	February 23, 1926	March 25, 1926
Rubber latex (Hevea)....*gal*	$1.50 @	$2.50 @	$2.00 @
CREPE			
First latex, spot	.43¼ @	.57 @.58	.60½ @
Mar.-Apr.	.43 @	.57 @.58	.60 @
Apr.-June	.42½ @	.55 @.56	.59½ @
July-Sept.	.41¼ @	.54 @.55	.58½ @
Oct.-Dec.	.40⅞ @	.53 @.54	.57½ @
Off latex, spot	.43½ @	.56 @.57	.59½ @
Amber No. 2, spot	.42½ @	.54 @.55	.58 @
Mar.-Apr.	.42¼ @	.53 @.54	.58 @
Apr.-June	.41½ @	.52 @.53	.57 @
July-Sept.	.40½ @	.51 @.52	.56 @
Oct.-Dec.	.40 @	.50 @.51	.55 @
Amber No. 3, spot	.42¼ @	.52½ @.53½	.57 @
Brown, thin, clean	.42¼ @	.51 @.52	.57 @
Brown, specky	.42 @	.50 @	.56 @
Brown, roll	.41 @	.48 @	.52 @
Sole crêpe	@	1.00 @	.95 @
SHEET			
Ribbed, smoked, spot	.43 @	.55½ @.56½	.59 @
Mar.-Apr.	.42½ @	.55½ @	.59 @
Apr.-June	.41¾ @	.54½ @.55½	.58½ @
July-Sept.	.40¾ @	.53 @.54	.57 @
Oct.-Dec.	.40⅝ @	.52 @.53	.56 @

East Indian	March 24, 1925	February 23, 1926	March 25, 1926
PONTIANAK			
Banjermassin	.07½ @.08	.17½ @	.17 @.19¼
Palembang	.08 @	@	@
Pressed block	.13 @.13½	.29 @	.32 @.36
Sarawak	.07 @	@	@
South American			
PARAS			
Upriver, fine	.36¼ @	.48 @	.54 @
Upriver, fine	*.47¾ @	*.69 @	*.74 @
Upriver, medium	.34½ @	@	.48 @
Upriver, coarse	.29½ @	.37 @	.41½ @
Upriver, coarse	*.40 @	*.54 @	*.60 @
Islands, fine	.34 @	@	.50 @
Islands, fine	@	*.65 @	*.66 @
Cametá	@	.36 @	.40 @
Acre, Bolivian, fine	.36¾ @	.49 @	.55 @
Acre, Bolivian, fine	*.48 @	*.70 @	*.75 @
Beni Bolivian	.37 @	.49 @	.56 @
Madeira	.37½ @	.49 @	.56 @
Peruvian, fine	@	@	.53 @
Tapajos, fine	@	.47 @	.51 @
CAUCHO			
Upper caucho ball	.31¾ @	.38 @	.43½ @
Upper caucho ball	*.40¼ @	*.55 @	*.62½ @
Lower caucho ball	.30 @	.36 @	.40 @
Manicobas			
Ceará negro heads	.28 @	.40 @	.45 @
Ceará scrap	.16 @	.12 @	.25 @
Manicobas 30% guaranty	.27 @	.42 @	.40 @
Mangabeira, thin sheet	.29 @	.42 @	.41 @
Centrals			
Central scrap	.32 @	.42 @	.40 @
Central wet sheet	.22 @	.32 @	.27 @
Corinto scrap	.32 @	.42 @	.41 @
Esmeralda sausage	.32 @	.42 @	.40 @
Guayule			
Duro, washed and dried	.35 @	.50 @	.48 @
Leon, washed and dried	@	@	.40 @
Africans			
Black Kasai	.37½ @	†.50 @	@
Black Upper Congo	.37½ @	†.48 @	@
Red Upper Congo	.32½ @	†.46 @	@
Kasai Loanda	.33½ @	@	@
Upper Congo Arumini	.35 @	@	@
Masai (Konakry)	@	@	@
Gutta Percha			
Gutta Siak	.17½ @	.33 @	.35 @.38
Gutta Soh	.28 @	@	.30 @.35
Red Macassar	3.00 @	3.50 @	3.00 @
Balata			
Block, Ciudad Bolivar	.70 @	.65 @	.64½ @
Colombia	.56 @	.53 @	.53½ @
Panama	.55 @	.53 @	@
Surinam, sheet	.78 @	.75 @	.74 @.75
amber	.81 @	.83 @	.78 @.80
Chicle			
Honduras	.58 @.68	‡.64 @	‡.64 @
Yucatan, fine	.58 @.68	‡.65 @	‡.65 @

*Washed and dried crêpe. Shipment from Brazil.
†Nominal. ‡Duty paid.

Comparative Low and High New York Spot Rubber Prices

	1926*	March 1925	March 1924
PLANTATIONS			
First latex crêpe	$0.53½ @ $0.64	$0.38½ @ $0.43¾	$0.20¼ @ $0.25½
Smoked sheet, ribbed	.52¾ @ .63	.38⅛ @ .43	.20⅛ @ .24¾
PARAS			
Upriver, fine	.44 @ .59½	.31½ @ .36¼	.18¼ @ .20½
Upriver, coarse	.35 @ .45	.26½ @ .29½	.15⅛ @ .17¼
Islands, fine	.40 @ .54	.30½ @ .34	.15 @ .18¼
Cametá	.30 @ .39	.16 @ .17	.10½ @ .11½

* Figured to March 25, 1926.

The Rubber Exchange of New York, Inc.

Daily Market Futures—Ribbed Smoked Sheets—Closing Prices—Cents Per Pound

	March, 1926																								
MONTHS	1	2	3	4	5	6	8	9	10	11	12	13	15	16	17	18	19	20	22	23	24	25	26	27
March	54.30	58.00	53.20	53.40	53.50	55.70	56.50	56.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
April	53.80	57.00	52.80	52.90	53.00	55.20	56.00	55.20	59.30	59.00	61.00	60.50	61.40	60.10	60.00	61.50	60.50	61.00	61.00	60.10	60.00	59.30	59.00	59.60
May	53.30	56.10	51.90	52.40	52.50	54.80	55.40	54.50	58.80	58.50	60.50	60.00	60.90	59.40	59.40	60.70	60.20	60.70	60.80	59.60	59.50	58.60	58.50	59.10
June	52.80	55.50	51.30	51.90	52.10	54.10	55.00	54.00	58.40	58.00	60.20	59.30	60.30	58.80	58.90	60.10	59.70	60.20	60.20	59.10	59.00	58.30	58.10	58.60
July	52.20	55.00	50.90	51.40	51.40	53.60	54.30	53.50	58.00	57.50	59.70	58.80	59.70	58.20	58.30	59.70	59.20	59.70	59.70	58.60	58.50	57.70	57.40	58.20
August	51.80	54.50	50.80	50.50	51.00	53.10	53.80	53.00	57.50	57.00	59.40	58.30	59.00	57.80	57.60	59.30	58.70	59.20	59.20	58.00	58.00	57.40	57.00	57.50
September	51.40	54.00	50.20	50.00	50.50	52.60	53.00	52.50	57.00	56.80	59.00	57.80	58.50	57.40	57.00	58.80	58.20	58.70	58.70	57.50	57.20	57.10	56.50	57.00
October	51.00	53.50	49.70	49.70	50.00	52.00	53.00	52.50	56.50	56.40	58.80	57.30	58.00	56.80	56.50	58.00	57.20	58.20	58.20	57.00	56.80	56.50	56.00	56.50
November	50.50	53.00	49.20	49.40	49.50	51.70	53.00	52.40	56.00	56.00	58.70	56.80	57.30	56.20	56.00	57.20	56.60	57.60	57.60	56.50	56.20	56.00	55.50	56.00
December	49.00	52.50	48.50	49.00	49.00	51.00	53.00	52.20	55.50	55.50	58.50	56.40	57.00	55.10	55.00	56.50	55.80	57.00	57.00	56.00	55.50	55.40	54.80	55.50
January	48.50	52.00	48.20	48.70	48.50	50.50	52.00	51.70	55.00	55.00	58.00	56.00	56.50	54.50	54.50	56.00	55.50	56.50	56.50	55.50	55.00	55.00	54.30	55.00
February	.....	.....	.....	.....	.....	.....	.....	.....	54.50	54.50	57.50	55.50	56.00	54.00	54.50	55.50	55.00	56.00	56.00	55.00	54.50	54.50	53.90	54.50

Reclaimed Rubber

New York

The demand for reclaims during the past month has not increased over that of the month previous owing to the backwardness of trade in general due to the late spring. Reclaims offer very good values at the current level of crude rubber. The market shows a downward trend in prices on all grades except unwashed shoes and mechanical blends. It is expected that prices will strengthen as the spring demand becomes insistent.

The scientific use of reclaimed rubber in treads has advanced the mileage of second quality tires so distinctly while maintaining moderate cost that consumer demand for such tires will doubtless reach a much larger proportion of the total demand than usual.

Reclaimers are operating at full capacity to meet the heavy demand which is concentrated heavily on tire and tube grades.

New York Quotations

March 25, 1926

	Specific Gravity	Price Per Pound
Auto Tire		
Black	1.21	$0.10¾ @ $0.11
Black, washed	1.18	.12 @ .12¼
Black selected tires	1.20	.12¼ @ .12¾
Dark gray	1.35	.16¼ @ .16½
Light gray	1.38	.17¼ @ .17½
White	1.40	.21½ @ .22
High Tensile Black		
Super-reclaim, No. 1	1.20	.29 @ .30
No. 2	1.20	.19½ @ .20
Shoe		
Unwashed	1.60	.10½ @ .10¾
Washed	1.50	.12¾ @ .13
Tube		
No. 1	1.60	.28 @ .29
No. 2	1.18	.19 @ .19½
Uncured Tire Friction		
No. 1	1.00	.48 @ .50
No. 2	1.20	.36 @ .38
Miscellaneous		
High grade, red	1.35	.21 @ .21½
Truck tire, heavy gravity	1.55	.10½ @ .10¾
Truck tire, light gravity	1.40	.11 @ .11¼
Mechanical blends	1.60	.08 @ .09

British Malaya

Rubber Exports

An official cablegram from Singapore to the Malay States Information Agency, 88 Cannon street, London, E. C. 4, England, states that the amount of rubber exported from British Malaya in the month of February last totaled 30,440 tons. The amount of rubber imported was 8,306 tons, of which 6,624 tons were declared as wet rubber.

The following are comparative statistics:

	1925		1926	
	Gross Exports Tons	Foreign Imports Tons	Gross Exports Tons	Foreign Imports Tons
January	19,183	10,132	30,452	10,237
February	21,622	10,071	30,440	8,306

Distribution

The following is a comparative return of distribution of shipments during the months of January and February, 1926:

	January, 1926 Tons	February, 1926 Tons
United Kingdom	5,364	7,269
United States of America	22,417	19,945
Continent of Europe	1,548	1,957
British possessions	540	600
Japan	577	669
Other foreign countries	6	...
Totals	30,452	30,440

Dealers' Stocks of Rubber

An official cablegram from Singapore to the Malay States Information Agency, 88 Cannon street, London, E. C. 4, England, states that dealers' stocks of rubber on January 31, 1926, were in Singapore 13,705 tons, and in Penang 2,021 tons, on February 28, 1926, in Singapore 11,538 tons, and in Penang 2,115 tons.

American exports of rubber manufactured goods, including rubber scrap, reclaimed and old rubber, reached a total value for 1923 of $36,972,125; in 1924, $39,650,217; and for 1925, $51,343,898.

The Market for Rubber Scrap

New York

A month ago orders for rubber scrap were few and there was a tendency for prices to decline in the slow market in the absence of reclaiming demand. The continuance of winter conditions has delayed spring collection of general scrap. Dealers, however, are expecting good business next month. Meantime, the market is described as passive. That is to say neither dealers nor reclaimers are making offers for scrap. Export business is reduced to the vanishing point on account of European credit conditions.

Boots and Shoes. The full list of boot and shoe grades of scrap has worked downward in price. The movement of shoes in general has been only fair.

Inner Tubes. Prices have declined but slightly from a month ago on No. 1 and No. 2 grades. Red and mixed tubes are unchanged.

Mechanicals. Air-brake hose declined $2 a ton while all other mechanicals are held at the figures quoted one month ago.

Mixed Tires. These are in moderate movement at prices lower for some grades and higher for others than a month ago. The list as a whole averages slightly lower.

Hard Rubber. Prices have dropped 1 cent a pound for No. 1 grade below those quoted a month ago.

Quotations for Carload Lots

March 25, 1926

Boots and Shoes		
Boots and shoes, black	lb.	$0.02¾ @ $0.02½
Red and white	lb.	.01¾ @ .01½
Trimmed arctics, black	lb.	.01½ @ .01¾
Untrimmed arctics	lb.	.01¾ @ .01½
Tennis shoes and soles	lb.	.01 @ .01⅛
Hard Rubber		
No. 1 hard rubber	lb.	.13 @ .15
Battery jars, black compound	lb.	.02½ @ .02¼
Inner Tubes		
No. 1, floating	lb.	.11 @ .11¼
No. 2, compounded	lb.	.09½ @ .09¾
Red	lb.	.08 @ .08¼
Mixed tubes	lb.	.08 @ .08¼
Mechanicals		
Mixed black scrap	lb.	.01¼ @ .01½
Heels	lb.	.01 @ .01⅛
Hose, air-brake	ton	28.00 @ 30.00
regular	ton	20.00 @ 21.00
No. 1 red	lb.	.03½ @ .03¾
No. 2 red	lb.	.01½ @ .02¼
Red packing	lb.	.01¾ @ .01½
White, druggists' sundries	lb.	.03⅞ @ .04
Mechanical	lb.	.02¼ @ .03¼
Tires		
Pneumatic Standard—		
Mixed auto tires with beads	ton	30.00 @ 32.00
Beadless	ton	40.00 @ 42.00
White auto tires with beads	ton	46.00 @ 48.00
Beadless	ton	66.00 @ 67.00
Mixed auto peelings	ton	50.00 @ 51.00
Solid—		
Mixed motor truck, clean	ton	48.00 @ 50.00

BRAKE LINING TESTS

Experiments at the Bureau of Standards, Washington, D. C., on a conventional design of passenger car in actual service with conventional linings showed the same general characteristics that had been observed in the laboratory tests, namely, a reduction in coefficient of friction with large increases in lining temperature. The marked differences between the behavior of saturated and unsaturated linings indicates that it is the action of the saturant which is almost entirely responsible for decreases in the coefficient of friction with increase in the temperature.

The tests indicate it is far more important to develop brake linings with coefficients of friction which vary over only a narrow range than to develop linings which under ideal conditions have extremely high coefficients. Also that the braking mechanism should have satisfactory ability when conditions are such that the coefficient of friction of the lining becomes abnormally low.

The Market for Chemicals and Compounding Ingredients

New York

In general the demand for rubber compounding materials is well maintained; however, some falling off was noticed in the tire and tube branch of the industry previous to resuming higher spring schedules of output. There is less activity in the spot market for the principal compounding ingredients.

Accelerators. There are so many well established good organic accelerators offered to rubber manufacturers that prices are becoming very competitive. Most manufacturers use several according to the types of goods they manufacture and the different curing conditions adopted. The suit to determine the validity of the Hoffmann-Gottlob patent accelerators was tried the past month and the decision is awaited with much interest by chemical manufacturers.

Benzol. This is in good volume of production which for the past month has been balanced by equally good demand. Prices are firm.

Carbon Black. Carbon black is moving mostly on large contracts into the rubber industry, the price holding firm for spot. On contracts for the second half of 1926 prices will probably be effected at an advance over those of the first half.

Clay. The demand for high grade compounding clay is well maintained because of its economy and technical quality in rubber products subjected to hard service. Prices are practically unchanged.

Litharge. Litharge on contract is moving steadily. Corroders continue to maintain prices unchanged on lead pigments and oxides, and demand for these products remains rather restricted in the spot market. The market for pig lead has fallen off more than one cent a pound within a month's time. This is one of the most drastic declines in the history of the metal. An oversupply of lead in the United States, brought about both by increased production and curtailed consumption in Europe and the United States, has caused the present downward tendency in prices.

Lithopone. The output is reported booked to June 30 with interest developing in positions beyond that date.

Mineral Rubber. This material is more than ever indispensable in view of the compounding economies developed in the industry in the past six months.

Solvent Naphtha. The great demand for this industrial solvent virtually overbalances the supply most of the time and maintains prices high and firm as at present.

Sublimed Lead. Market conditions have been dull and quiet the entire month.

Zinc Oxide. The spot market is quiet. The movement is steady into consuming channels applying on contracts covering the first half year.

New York Quotations

March 25, 1926

Accelerators, Inorganic			
Lead, carbonate	lb.	$0.10¼	@
Lead, red	lb.	.12¼	@
sublimed blue	lb.	.10	@
sublimed white	lb.	.10	@
Lime, R. M. hydrated	ton	15.00	@
Litharge	lb.	.11¾	@
Magnesia calcined, light, (bbls.)	lb.	.20	@
calcined, md. light (bbls.)	lb.	.07	@
calcined, extra light (bbls.)	lb.	.40	@
calcined, heavy (bbls.)	lb.	.05	@
magnesium, carb., light (bags)	lb.	.06½	@ .06¾
Orange mineral A.A.A.	lb.	.14½	@
Rubber lead No. 4	lb.		@
Accelerators, Organic			
A-7	lb.	.65	@ .80
A-19	lb.	.75	@ .90
Aldehyde ammonia	lb.	.82	@ .95
Aniline (factory)	lb.	.17	@
B. B.	lb.	1.05	@ 1.07
D. P. G. salt	lb.	.76	@
Diethyl amine	lb.		@
Dimethyl amine	lb.		@
Di-ortho-tolylguanidine	lb.	1.08	@
Diphenyl guanidine	lb.	.88	@
Ethylidine aniline	lb.	.65	@
Excellerex	lb.	.35	@ .40
Formaldehyde aniline	lb.	.42	@
Grasselerator 808	lb.	1.25	@ 1.50
Heptene	lb.	.55	@
Hexamethylene tetramine	lb.	.80	@ .85
Methylene aniline	lb.	.36	@ .40
Monex	lb.	3.75	@ 5.00
No. 999 lead oleate	lb.	.17	@ .18
Para-nitrosodimethylaniline	lb.		@
Paraphenylene diamine	lb		@
Quinodine	lb.		@
R. & H. 50 (100 lb. drums)		.60	@
Super-sulphur, No. 1	lb.	.50	@
No. 2	lb.	.18	@ .25
Tensilac No. 39	lb.	.70	@
No. 41	lb.	.65	@
Thiocarbanilide	lb.	.25	@ .30
Trimene	lb.	.75	@
base	lb.	1.20	@ 1.35
Accelerators, Organic—(Continued)			
Triphenylguanidine	lb.	$0.73	@
Tuads	lb.	4.50	@ 5.00
Zimate	lb.	5.00	@
Acids			
Acetic 28% (bbls.)	100 lb.	$3.50	@
glacial (carboys)	100 lb.	12.21	@
Oleic	lb.	.10½	@ .10¾
Sulphuric, 66° (carboys)	lb.	.02½	@
Alkalies			
Caustic soda	100 lbs.	3.10	@ 3.91
Anti Oxidants			
Agerite	lb.	.85	@ .90
V. G. B.	lb.	.70	@
Colors			
BLACK			
Bone	lb.	.05½	@ .11
Carbon			
A. & W. nonfli	lb.	.40	@
Aerfloted arrow	lb.	.09	@ .13
Compressed	lb.	.09½	@ .13½
Uncompressed	lb.	.09	@ .13
Micronex	lb.	.10	@ .14
Drop	lb.	.07½	@ .15
Lampblack	lb.	.12	@ .40
Thermatomic carbon	lb.	.05	@
BLUE			
A. & W. blue	lb.	2.00	@
Du Pont, N.	lb.	1.35	@
Marine, A. C.	lb.	1.30	@
Prussian	lb.	.34	@ .35
Ultramarine	lb.	.09	@ .35
BROWN			
Sienna, Italian	lb.	.04	@ .14
Umber, Turkey	lb.	.04	@ .16
GREEN			
A. & W. green	lb.	2.00	@
Chrome, light	lb.	.28	@ .39
medium	lb.	.30	@ .40
dark	lb.	.31	@ .43
Du Pont, G. L.	lb.	.30	@
Y. L.	lb.	.75	@
Oxide of chromium	lb.	.35	@ .38
Colors—(Continued)			
ORANGE			
Du Pont R. O.	lb.	$1.30	@
R. X.	lb.	1.30	@
Y. O.	lb.	1.60	@
Y. X.	lb.	1.15	@
RED			
A. & W. red (4 shades)	lb.	2.50	@
purple	lb.	2.00	@
Antimony, golden	lb.	.16	@
golden 15/17 % G. E.	lb.	.20	@
Antimony, crimson	lb.	$0.27	@
crimson, R.M.P. No. 3.	lb.	.52	@
7-A	lb	.37	@
Z-2	lb	.20	@
Sulphuret vermilion	lb.	.37½	@
Du Pont R. I.	lb.	2.00	@
R. S.	lb.	1.45	@
Brilliant A. C.	lb.	1.35	@
Iron Oxides			
bright red pure domestic	lb.		@
bright red pure English	lb.	.14	@
bright red reduced English	lb.	.11	@
bright red reduced domestic	lb.		@
Indian (maroon), red pure domestic	lb.	.10	@ .15
Indian (maroon), red pure English	lb.	.11	@ .15
Indian (maroon), red reduced English	lb.	.09	@ .10
Indian (maroon), red reduced domestic	lb.	.08	@ .10
Oximony	lb.	.13¼	@
Spanish red oxide	lb.		@
Venetian reds	lb.	.02¼	@ .05½
Vermilion, English quicksilver	lb.	1.57	@ 1.62
WHITE			
Albalith	lb.	.05½	@ .06⅛
Lithopone	lb.	.06¾	@
Azolith	lb.	.05½	@ .06⅛
Sterling	lb.	.05½	@ .06⅛
Zinc Oxide			
AAA (lead free)	lb.	.07¼	@ .07¾
Azo (factory):			
ZZZ (lead free)	lb.	.07¼	@ .07¾
ZZ (5% leaded)	lb.	.06⅞	@ .07⅛
Z (8% leaded)	lb.	.08	@ .08½

New York Quotations

March 25, 1926

Colors

WHITE—(Continued)

French Process			
Green seal	lb.	$0.11½	@
Red seal	lb.	.10½	@
White seal	lb.	.12⅜	@ .12¾
Horse Head Brands			
Selected	lb.	.07¾	@ .08¼
Special	lb.	.07¾	@ .08¼
XX red	lb.	.07¼	@ .07¾
Leaded Brands			
Lehigh	lb.	.08	@ .08½
Standard	lb.	.06⅞	@ .07⅜
Sterling	lb.	.08	@ .08½
Superior	lb.	.08	@ .08½
Palmerton Process			
Kadox, black	lb.	.10⅞	@ .11⅜
blue	lb.	.09⅞	@ .10⅜
red	lb.	.08⅞	@ .09⅛

YELLOW

A. & W. yellow	lb.	2.50	@
Arsenic	lb.		@
Chrome	lb.	.17½	@ .18½
Du Pont N		4.00	@
Grasselli cadmium	lb.	1.60	@ 1.75
Ochre, domestic	lb.	.01¼	@ .02½
imported	lb.	.02¾	@ .04½
Oxide, pure	lb.	.09	@ .10½

Compounding Ingredients

Aluminum flake (sacks c.l.)	ton	21.85	@
(sacks l.c.l.)	ton	24.50	@
Aluminum silicate	ton	25.00	@ 28.00
Ammonia carbonate	lb.	.12	@ .14
Asbestine	ton	13.50	@ 14.50
Barium, carbonate	ton	48.00	@ 50.00
dust	lb.	.05	@ .06
Barytes, imported	ton	30.00	@
water ground and floated	ton	23.00	@ 25.00
Basofor	lb.	.04½	@
Blanc fixe, dry	ton	75.00	@ 78.00
pulp	ton	53.00	@ 56.00
Carrara filler	lb.	.01¾	@
Chalk	lb.	.02½	@ .04½
Clay, blue ribbon (c. l. fcty.)	ton	14.00	@
Blue Ridge, dark	ton	9.00	@
light	ton	12.00	@
Catalpo (facty.)	ton	38.00	@ 40.00
China	lb.	.01½	@
Dixie	ton	20.00	@
Langford	ton	12.00	@
Mineral Flour (Florida)	ton	17.00	@ 20.00
Seminole (Georgia)	ton	16.00	@
Suprex	ton	20.00	@ 30.00
Tuscan	ton	12.00	@
White floss	ton	17.00	@
Cotton flock, black	lb.	.12	@ .12½
light-colored	lb.	.12	@ .14
white	lb.	.15	@ .24
Cotton linters clean mill run	lb.		@
Glue, high grade	lb.	.20	@ .29
medium	lb.	.18	@ .24
low grade	lb.	.12	@ .14

Compounding Ingredients—(Continued)

Infusorial earth	lb.	$0.02½	@
Mica, amber (fact'y)	lb.	.05	@
Pumice stone, powd	lb.	.03	@ .05
Rotten stone (bbls.)	lb.	.02½	@ .04½
Slate flour (fact'y c. l.)	ton		@
Soap bark	lb.	.09¼	@ .10
Soapstone	ton	15.00	@ 22.00
Sodium bicarb	100 lbs.	2.00	@ 2.41
Starch, powd. corn			
Buffalo (bbls.)	100 lbs.	3.39	@ 3.49
Buffalo (bags)	100 lbs.	3.12	@ 3.22
Talc, domestic	ton	40.00	@ $50.00
Terra blanche	ton	23.00	@ 25.00
Whiting, alba	ton	12.00	@
Chalk, imported			
Commercial	100 lbs.	.90	@ 1.00
Westminster	100 lbs.	1.60	@ 2.00
English, cliffstone	100 lbs.	1.50	@
Nelco	ton	12.00	@ 22.50
Quaker	ton	13.00	@
Sussex	ton	8.00	@
Westminster Brand	100 lbs.	1.60	@ 2.00
Witco (c.l.) (fact'y)	ton	12.00	@
Wood pulp, XXX (facty.)	ton	35.00	@
X (facty.)	ton	25.00	@

Mineral Rubber

Genasco (facty.)	ton	50.00	@ 52.00
Gilsonite (fact'y)	ton	37.14	@ 39.65
Granulated M. R.	ton	33.00	@ 38.00
Hydrocarbon, hard	ton	29.00	@ 35.00
Hydrocarbon, soft	ton	29.00	@ 35.00
Ohmlac Kapak, M-R	ton		@
K-4	ton		@
320/340 m. p. hydrocarbon	ton	47.00	@ 52.00
300/310 m. p. hydrocarbon	ton	42.00	@ 47.00
Paradura (fact'y)	ton	70.00	@ 72.50
Pioneer, M. R., solid (fac.)	ton	42.00	@ 44.00
M. R. granular	ton	52.00	@ 54.00
Robertson, M. R. solid (facty.)	ton	35.00	@ 75.00
M. R. gran. (facty.)	ton	42.00	@ 80.00

Oils (Softeners)

Castor, No. 1, U. S. P	lb.	.13½	@
No. 3, U. S. P	lb.	.13	@
Corn, crude (bbls.)	lb.	.11¼	@
Cotton, summer yellow	lb.	.13	@
Cycline	gal.	.25	@ .31
Glycerine	lb.	.24	@ .24½
Linseed, raw	gal.	.10½	@ .12
Liquid rubber	lb.	.12	@
Palm lagos	lb.	.09½	@
niger	lb.	.09½	@
Peanut, crude	lb.	.12¾	@
refined	lb.	.14	@
Petrolatum, standard	lb.	.06	@ .08
sticky	lb.	.08	@ .10
Pine, steam distilled	gal.	.68	@
Rapeseed, refined	gal.	.88	@
Rosin	gal.	.62	@
Synthecite	lb.	.06	@
Tar	gal.	.55	@

Resins and Pitches

Pitch, Burgundy	lb.	$0.06½	@
coal tar	bbl.	8.00	@
Fluxol hardwood	lb.	.02	@ .04
ponto	lb.	.06½	@
Rosin, K (bbl.)	280 lbs.	15.50	@
strained (bbl.)	280 lbs.	12.00	@
Shellac, fine orange	lb.	.70	@
Tar, pine, retort	bbl	15.75	@ 20.00
kiln	bbl.	18.00	@

Solvents

Benzol (90%, 7.21 lbs. gal.) pure	gal.	.28	@
Carbon bisulphide (10.81 lbs. gal.) 99.9% pure (drums)	lb.	.05½	@ .06¼
tetrachloride (13.28 lbs. gal.) 99.7% pure (drums)	lb.	.07	@ .08
Gasoline			
No. 303			
Tankcars	gal.	.22	@
Drums, c. l.	gal.	.25	@
Drums, l. c. l.	gal.	.28	@
Naphtha			
68° Bé., 122°, 524°	gal.	.20	@
70° Bé., 114°, 314°	gal.	.21	@
71° Bé., 112°, 304°	gal.	.22	@
Turpentine, spirits	gal.	1.06	@
wood, steam distilled	gal.	.95	@

Substitutes

Black	lb.	.08½	@ .14
Brown	lb.	.09	@ .16
White	lb.	.10	@ .17

Vulcanizing Ingredients

Sulphur chloride (drums)	lb	.04½	@ .05
Soft rubber, 100% pure (c.l.)	100 lbs.	2.50	@ 2.75
(l.c.l.)	100 lbs.	2.80	@ 3.30
Sulphur, Brooklyn brands			
Refined velvet (bbls.)	240 lbs.	3.05	@ 3.30
(bags)	150 lbs.	2.80	@ 3.05
Superfine flour (bbls.)	210 lbs.	2.65	@ 2.95
(bags)	100 lbs.	2.30	@ 2.60
Tire brand, superfine	100 lbs.		@
Tube brand, velvet	100 lbs.		@

(See also Colors—Antimony)

Waxes

Wax, beeswax, white, com.	lb.	.55	@
carnauba	lb.	.38	@ .50
ceresine, white	lb.	.12½	@
montan	lb.	.08	@
orokerite, black	lb.	.30	@
green	lb.	.32	@
Paraffin			
122/124 white crude scale	lb.	.05¼	@ .05¾
124/126 white crude scale	lb.	.05¼	@ .05¾
120/122 fully refined	lb.	.06¼	@ .06¾
125/127 fully refined	lb.	.06¾	@ .06½

CONSUMPTION OF ACCELERATORS

While there are no authoritative statistics on the consumption of organic accelerators in the United States it has been estimated that the total exceeds 3,000 tons annually. The accelerators of chief technical and commercial importance are diphenyl guanidine, diortho-tolyl guanidine, triphenyl guanidine, resinous aldehyde-amine derivatives, and the ultra accelerators such as tetra-methylene thiuram disulphide and related substances.

Organic accelerators were first introduced in the manufacture of tires and tubes. Their success led later to their use in molded and mechanical rubber goods. Recently they have been adopted in dry heat curing of footwear, etc., and in insulated wire, automobile topping and many lines of average quality products containing reclaimed rubber. Certain accelerators are also adapted for hard rubber work. In fact today there are virtually no rubber products in which an accelerator of some type is not advantageous.

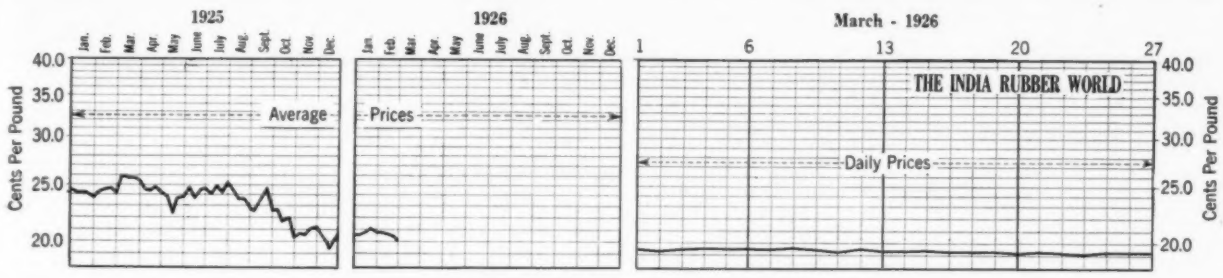
The general adoption of accelerators and developments in their methods of manufacture have brought about a reduction in their cost to the rubber trade. Domestic chemical concerns have a permanent advantage in the accelerator market owing to the large demand, their close touch with rubber manufacturing conditions and developments in rubber compounding and research which characterize the American rubber industry.

EXPORTS OF RUBBER COMPOUNDING INGREDIENTS—1925

Exports from the United States of the compounding ingredients listed below showed advances as compared with 1924, white lead being the only exception. Shipments of sulphur during 1925 totaled 629,400 tons, value $10,919,200, a gain of 40 per cent over the 1924 figures, while other exports during the past year were: Zinc oxide, 21,710,000 pounds, value $1,503,600; lithopone, 2,573,400 pounds, value $132,800; carbon black, 43,182,600 pounds, value $3,555,800; bone and lamp blacks, 3,804,000 pounds, value $249,600; red lead, 1,604,500 pounds, value $183,600; and white lead, 13,663,300 pounds, value $1,293,200.

INCREASE IN TIRE EXPORTS TO SOUTH AMERICA

With the single exception of British and Dutch Guiana, American tire exports to South America have during the last three years shown a steady increase. Brazil's tire and tube imports, for example, have trebled in both quantity and value during 1925 as compared with 1923, while those of Chile, Colombia and Venezuela have more than doubled. During 1923 Argentina imported automobile tires to the value of $1,125,720, the figure rising to $1,290,836 for 1924, and to $2,021,527 for 1925. Relatively Paraguay has made the greatest advance, taking in 1923 a total amount of tires and tubes valued at only $660, the figure rising in 1924 to $4,284, and in 1925 to $4,799.



Ratio Graph of New York Daily Prices of Spot Middling Upland Cotton

The Market for Cotton and Other Fabrics

New York

AMERICAN COTTON. Spot middlings cotton has been generally quiet and dull for the past month. The price declined from 20.60 cents on February 23 to 19.15 cents on March 23 due to general lack of confidence. The demand is improving, however, and the mills are replenishing their supplies at present prices. Spot demand continues slow. Indications are that the mills will continue on a hand-to-mouth basis in view of the prospects of a 5,500,000 bale carry-over and with a world production last year 12 per cent more than the year previous. Final ginning reports give the size of the last crop as 16,400,000 bales. Planting has begun in southwestern Texas and southern Louisiana. Advices from the south indicate that practically the same area will be planted as last season thus the assumption finds general acceptance that, conditions being favorable, the crop this year will probably be as large as that of last year. The opinion has been expressed that the only hope for the constructive side of the market appears to be that some calamity may overtake the growing crops, otherwise cotton may sell down to 12 cents which would be below the cost of production.

ARIZONA COTTON. The Arizona crop has mostly been marketed. The only lots remaining not in merchants' hands are the usual soft staples which commonly appear at the end of the season. The 1926 area in Pima cotton is understood to be considerably reduced from that of last year.

EGYPTIAN COTTON. The Alexandria market has continued to decline notwithstanding continuous government buying to maintain prices. Medium Sakels can now be bought between 31 and 33 cents, and Medium Uppers around 24 cents. There is still a large stock of cotton in Alexandria and in the country south. Approximately the same acreage for the present season is now indicated as for the last one.

Cotton Fabrics

DUCKS, DRILLS AND OSNABURGS. The quiet condition prevailing for six weeks prior to March 1 is replaced by renewed activity. Consumers' inventories are believed to be comparatively meagre in these lines with consequent pressure on producers for quick delivery thus serving to hold values reasonably firm. Where cotton goods specialties are concerned the present situation indicates that delivery is of greater importance to the consumer than the price and is liable to so continue for some months to come. The opening of spring is expected to bring a marked improvement in the demand for cotton and all lines of cotton goods.

RAINCOAT FABRICS. Business in raincoat fabrics is at present somewhat quiet but good spot requirements will become evident with the coming of warmer weather and April rains.

SHEETINGS. The market is rather weak, business quiet and mills ready to listen to propositions. This is strictly a buyers' market although there is very little buying interest except for actual needs and in minimum quantities. The recent large ginning report has caused buyers to believe that prices will be still lower.

TIRE FABRICS. For the past two months the market for tire fabrics has been unusually quiet. Continuance of this state is due to the curtailment of tire production awaiting delayed spring replacement orders. Tire companies generally have contracted for

New York Quotations

March 25, 1926

Drills

38-inch 2.00-yard	*yard*	$0.19 @
40-inch 3.47-yard		.11⅛ @
52-inch 1.90-yard		.20½ @
60-inch 1.52-yard		.25⅜ @

Ducks

38-inch 2.00-yard	*yard*	.19 @
40-inch 1.47-yard		.25½ @
72-inch 16.66-ounce		.43⅜ @
72-inch 17.21-ounce		.45½ @
MECHANICAL		
Hose and belting	*pound*	.37 @
Specials		.41 @
TENNIS		
52-inch 1.35-yard	*yard*	.30 @

Hollands

DEAD FINISH		
Standard, 37-inch	*yard*	.19¼ @
42-inch		.23½ @
RED SEAL		
36-inch		.17 @
40-inch		.18 @
50-inch		.28¼ @
FLAT FINISH		
Imperial, 36-inch		.15½ @
40-inch		.17½ @

GOLD SEAL

40-inch		$0.29 @

Osnaburgs

40-inch 2.35-yard	*yard*	.17 @
40-inch 2.48-yard		.16⅛ @
40-inch 3.00-yard		.13⅜ @
37-inch 2.42-yard		.16½ @

Raincoat Fabrics

COTTON		
Bombazine 64 x 60	*yard*	.12½ @
Bombazine 60 x 48		.11½ @
Plaids 60 x 48		.12½ @
Plaids 56 x 44		.11¾ @
Surface prints 60 x 48		.12½ @
Surface prints 64 x 60		.13½ @

Sheetings, 40-inch

40 x 48, 2.50-yard	*yard*	.14 @
48 x 48, 2.85-yard		.12¼ @
64 x 68, 3.15-yard		.13½ @
56 x 60, 3.60-yard		.11½ @
48 x 44 3.75-yard		.09¾ @

Sheetings, 36-inch

48 x 48, 5.00-yard	*yard*	$0.08½ @
40 x 40, 6.15-yard		.06¼ @

Tire Fabrics

SQUARE WOVEN 17¼-ounce		
Egyptian, karded	*pound*	.51 @ .52
Peeler, karded		.45 @ .46
CORD 23/5/3		
Egyptian, combed	*pound*	.57 @ .58
Egyptian, karded		.51 @ .53
Peeler, combed, 1 1/16-in.		.54 @
Peeler karded, 1 1/16-in.		.47 @ .48
CORD 23/4/3		
Peeler, karded	*pound*	.47 @ .48
CORD 13/3/3		
Peeler, karded	*pound*	.44 @ .45
LENO BREAKER		
8-oz. Peeler, karded	*pound*	.45 @ .46
10-oz. Peeler, karded		.45 @ .46
CHAFER		
8.25-oz. Peeler, karded (2 ply)	*pound*	.44 @ .45
9.5-oz. Peeler, karded (4-ply)		.46 @ .47
12-oz. Peeler, karded		.46 @ .47
14-oz. Peeler, karded		.46 @ .47

their supplies for the second quarter of the year and new business has not materialized to the extent hoped for, causing the market to be slow in assuming new features. The fabric mills are well supplied with contracts which keep them running on full or overtime production. Fabric production in rubber company owned cotton mills has shown a steady increase. Their output, however, is a minor portion of the total requirements of the American tire industry, being estimated at only 15 per cent of the total amount.

The Cotton Outlook

Demand for American Cotton Declining?

The decline in exports of American raw cotton as indicated in recent compilations is confirmed in a recent preliminary report issued by the Department of Commerce. In this report it is shown that the total foreign trade of the United States for the month of February resulted in an adverse balance of approximately $36,000,000, as compared with a similar balance of about $19,500,000 in January, while statistics for February, 1925, indicated a favorable balance of trade totaling $37,289,000. The Department of Commerce explains the present falling-off in the country's export trade as due almost entirely to smaller shipments from the United States of raw cotton, and also points out that exports of this commodity during February were about $23,000,000 less in value than those of February, 1925.

In a recent editorial entitled "Net Importers?" the *Journal of Commerce* comments on the Department of Commerce statistics, saying in part:

There need be no longer doubt in any mind as to the cause of our declining export sales. That may be found for the most part in the economic conditions existing practically throughout the whole of Europe. At the present moment our failure to send more cotton abroad is being assigned the blame for our adverse trade balance, which again is technically accurate. The real trouble is, however, that Europe is not finding it possible to export finished goods in anything like the quantity that had been hoped for and in consequence is not buying so heavily of our raw materials and other goods needed for full operation of her factories. * * * The sum and substance of the matter is that it is as yet too early to be sure of the future trend of our trade balance, but that the time has definitely come for us to be giving some very careful thought to the underlying factors that can be counted upon to govern that trend.

An article appearing in *The New York Commercial* and entitled "The Future of the Cotton Market Is Determined by Its Past Inactivity" quotes an authority as saying in regard to American cotton shipments:

It looked at one time, a few months ago, when cotton exports were running more than 400,000 bales ahead of last season, as if increased foreign demand would take care of a large proportion of the excess surplus brought about by the heavy yield this season, but, unfortunately, these exports have steadily dropped off until at present they are 200,000 bales under last year's, this decrease in export demand being likewise largely due to a feeling of confidence among the foreign spinners that they would be able to secure their cotton as they need it without taking a great chance of having to pay higher prices.

Foreign Countries Plan Increased Cotton Acreages

Various publications report attempts being made by foreign nations to become independent of the American cotton industry through increases in cotton acreage, and improved conditions are mentioned in such countries as Australia, India, Peru, Colombia, etc. England is especially represented as having such plans, *The Daily News Record* saying:

England may be independent of American cotton in 1936 or 1940, if she maintains her ownership of the new cotton lands in Australia, Africa, etc. The British Cotton Growing Association is presumably showing an annual new production of 250,000 to 300,000 bales, exclusive of India. For 1925 it may show 350,000 versus 179,000 in 1923 and may rise to 420,000 in 1926 owing to the completion of the Sennar dam in the Sudan.

Much of this cotton is superior to middling American—from 1⅛ to 1⅜ staple. Since 1920 the India cotton production by jumping from a 3,400,000 average to around 5,000,000 has helped the industries of Japan, Italy, etc. India cotton is short and coarse and cannot be used for finer counts. India presents a large acreage future but the acre returns are low.

Apparently, if the outside world can produce 11,000,000 bales it can produce 22,000,000. In 1880 the United States acreages were averaging around 12,000,000 and in 1890 they had risen to 20,000,000. England is about to spend money on railroads in Africa, etc. With proper railroads her new venture might be raising 2,000,000 bales by 1928? * * *

The big world struggles of the future undoubtedly lie among cotton, oil and such things. Cheap cotton built the present foundations of the United States and England. After grain—our daily bread—is there a bigger thing in the world than cotton?

Gains in World Cotton Production and Stocks

According to the Department of Agriculture the cotton production of all countries reporting to date for 1925-26 is estimated at 25,309,000 bales of 478 pounds, an increase of 9 per cent over 23,222,000 bales produced by the same nations last year, the acreage showing also an increase of 9.5 per cent. The group of countries reporting, which produced 94 per cent of the estimated world total, included the following: United States, India, Egypt, China, Russia, Chosen, Bulgaria, Anglo-Egypt, Sudan, Laguna, Lower California and Algeria.

From the same source as quoted above it is learned that world cotton stocks, as of July 31, 1926, are estimated at 10,364,000 bales, a figure based on the world's carryover as of July 31, 1925, of 6,114,000 bales; production, 27,600,000 bales; and world's consumption, 1925 and 1926, of 23,350,000 bales.

Domestic Consumption of Cotton

Mill consumption of cotton in the United States is estimated by the Census Bureau as reaching a total for the seven months ended February 28 of 3,744,415 bales, an increase of approximately 241,000 bales over consumption during the corresponding period last season.

The total raw cotton in consuming establishments of the United States on February 28 was reported as 1,831,296 bales, as against 1,542,296 bales on February 28, 1925, while cotton in public storage and at compresses on that date of this year was 4,744,090, as against 3,073,396 bales twelve months before.

Imports of cotton for February, 1926, were 38,355 bales, as against 59,902 bales in February, 1925, a drop of nearly 19,000 bales having taken place in imports of Egyptian cotton.

Larger Cotton Crop Reported

A recent estimate by the Department of Agriculture places the world's cotton production for the 1925-1926 season at 27,800,000 bales of 478 pounds, as compared with 24,800,000 bales for the preceding season, the total supply thus being about 12 per cent greater than it was in 1924-1925. Consumption has, however, not increased in proportion, and on March 1 stocks on hand throughout the world were estimated at about 11 per cent more than on March 1, 1925. The report of the Census Bureau indicates that total ginnings of the 1925 American cotton crop amounted to 16,085,905 bales.

Reviewing the general situation since August, the report of the Department of Agriculture pointed out that the present season has been characterized not only by abundant supplies, but also by a relative scarcity of cotton of the higher grades, falling prices and consequent holding off by the trade. Not only has the price movement been downward this season, it was noted, but fluctuations have been wider than usual.

REPORT OF RIMS INSPECTED AND APPROVED BY THE TIRE AND RIM ASSOCIATION OF AMERICA, INC.

Rim Size	February, 1926 Number	Per Cent	Two Months, 1926 Number	Per Cent
Motorcycle Rims				
24 x 3	2,116	0.1	7,811	0.2
26 x 3	6,240†	0.3	12,206	0.3
28 x 3	592	0.0	1,723	0.0
Clincher Rims				
30 x 3	737	0.0	737	0.0
30 x 3½	315,213	14.5	689,139	16.6
31 x 4	3,027	0.1	4,549	0.1
Balloon Rims				
27 x 3½	.....	...	.....	...
28 x 3½*	783,747	36.1	1,576,090	38.0
29 x 3½*	.....	...	.....	...
28 x 4*	209,626	9.7	407,962	9.8
29 x 4*	374,846	17.3	561,559	13.9
30 x 4*	358	0.0	2,087	0.0
29 x 4½*	18,572	0.9	74,281	1.8
30 x 4½*	189,635	8.7	347,931	8.4
11 x 4½*	.....	...	2,880	0.1
30 x 5*	31,401	1.5	46,340	1.1
31 x 5*	65,071	3.0	90,698	2.2
33 x 6*	14,879	0.7	21,075	0.5
High Pressure Rims				
30 x 3½	9,046	0.4	25,616	0.6
32 x 3½	.....	...	2,050	0.0
31 x 4	4,026	0.2	4,162	0.1
32 x 4	19,625	0.9	33,282	0.8
33 x 4	.....	...	.....	...
34 x 4	.....	...	.....	...
32 x 4½	38,217	1.8	84,144	2.0
34 x 4½	.....	...	1,680	0.0
Truck 20"				
30 x 5	27,629	1.3	74,433	1.8
32 x 6	33,815	1.6	40,679	1.0
34 x 7	4,245	0.2	5,166	0.1
36 x 8	1,315	0.1	1,515	0.0
40 x 10	.....	...	.....	...
Truck 24"				
34 x 5	914	0.0	6,531	0.1
36 x 6	9,745	0.5	17,713	0.4
38 x 7	2,730	0.1	2,942	0.1
40 x 8	606	0.0	1,723	0.0
44 x 10	.....	...	.....	...
Totals	2,168,223	100.0	4,148,704	100.0

	Per Cent		Per Cent
Motorcycle	0.4	Motorcycle	0.5
Clincher	17.1	Clincher	16.7
Balloon	75.9	Balloon	75.8
High pressure	3.3	High pressure	3.5
Truck—20"	3.2	Truck—20"	2.9
Truck—24"	0.6	Truck—24"	0.6

†Of the 6,240—26 x 3 motorcycle rims, 3,106 are 3" auto section. All others are regular "CC."
*Balloon tires

N. T. D. A. COMPLETES TIRE SURVEY

The survey recently made by the National Tire Dealers' Association shows that stocks of tires in dealers' hands on January 1, 1926, were 67 per cent higher than for the same date a year ago. The average number of tires per dealer was 663 as against 397 a year ago, with tubes numbering 1,130 as compared with 643 the year previous. The average number of solid tires per dealer stood at 141, while a year ago the figure was 85.

The majority of the dealers reporting were in favor of fewer sizes and types of tires, while at least 50 per cent had found repair work necessary and during the past year had installed vulcanizing equipment. In the future the association will make quarterly surveys.

AMERICAN EXPORTS OF CANVAS RUBBER-SOLED SHOES

Argentina continues to be the leading market for American-made canvas rubber-soled shoes, taking during the past year a total of 947,699 pairs, value $542,952. Cuba followed with 764,838 pairs, value $443,320; the Philippine Islands taking 546,735 pairs, value $449,294; Mexico, 474,312 pairs, value $385,015, and the United Kingdom, 312,212 pairs, value $243,708. Other important customers included the Dominican Republic, the Dutch West Indies, Colombia and Denmark. During the year American exports to all countries totaled 4,641,664 pairs, value $3,291,467. Corresponding figures for 1922 were: 2,977,627 pairs, value $2,358,463.

Metal Market Review

New York

During March the markets have all continued somewhat dull, with the exception of tin, prices of this metal reaching during the middle of the month the highest level since 1919. The steel industry also showed record figures for continuous production, the output in the four months to March 1 being the largest by about 3 per cent in any period of four consecutive months. *The Iron Trade Review* says that there is every indication that March will set a new high mark for all time in the monthly steel output.

Aluminum. Automotive demand for foundry requirements continues good. The import situation has undergone no change, although Germany is said to be becoming a more active factor in the local market. Virgin metal, 98 to 99 per cent pure, is obtainable as ingots at 27 to 28 cents a pound, delivered.

Antimony. The market is decidedly easier, quite inactive and prices lower. Chinese metal for spot and early delivery was quoted during March at 17 cents, New York, duty paid.

Copper. Prices for this metal have become stronger, and the demand in the domestic market has considerably improved. According to the *Journal of Commerce*, the present consumption of copper in the United States is 110 per cent greater than in 1913, while Europe is using 25 per cent more copper than then.

Lead. During the past few weeks prices for this metal have shown a continued decline, one of the most drastic in its history, the slump being all the more remarkable as lead is usually considered the steadiest of the metals, particularly in comparison with tin and zinc. On March 23 the leading producers were quoting 8.20 cents, New York, and 8 cents, East St. Louis.

Steel. Production of steel ingots during the past four months is said to have averaged 156,000 tons daily, the two leading features of the industry during this period being the steadiness in production and also steadiness in prices. *The American Metal Market* states: "Never in all its history has the steel industry had such a fully sustained operation without having had the foundation of a large volume of forward buying."

Tin. On March 16 the price of spot tin reached 66 cents a pound, the highest price since 1919, a slight decline, however, soon following. The entire tin situation is most unusual, as the world's visible supply is said to be steadily shrinking.

Zinc. Stocks of this metal have increased, while during the early part of March the new low price of the year was reached, at 7.35 cents a pound. During the last of the month the situation showed some improvement.

Basic Metals

March 24, 1926

	Cents per pound	
Aluminum, virgin, 98@99 per cent	27.00	@
Antimony	21.00	@21.50
Copper—Lake, spot	14.25	@
Electrolytic, spot	14.125	@
Castings, refinery	13.625	@
Lead, spot, New York	8.20	@ 8.45
Lead, spot, East St. Louis	8.00	@ 8.125
Nickel, ingot, pound	35.00	@
Tin, spot	65.00	@
Zinc, spot, New York	7.75	@ 7.80
Zinc, spot, East St. Louis	7.40	@ 7.45

Steel Wire

Base Price* on No. 9 Gage and Coarser

	Cents per pound	
Bright basic	4.25	@
Annealed soft	4.50	@
Galvanized annealed	5.15	@
Coppered basic	5.15	@
Tinned soft Bessemer	6.15	@

*Regular extras for lighter gage.

Copper Wire

Base Price F. O. B. Factory

	Cents per pound	
Bare copper wire	16.25	@
No. 6 B. & S. gage	16.25	@
No. 8 B. & S. gage	16.25	@
No. 14 B. & S.	17.25	@

United Kingdom Rubber Statistics

Imports

Unmanufactured	January, 1925		January, 1926	
Crude rubber				
From—	Pounds	Value	Pounds	Value
Straits Settlements	4,867,800	£333,945	11,574,300	£2,097,836
Federated Malay States	2,027,800	141,231	3,765,100	666,524
British India	1,170,600	77,502	1,271,700	230,737
Ceylon and Dependencies	2,242,700	144,927	3,589,800	654,634
Other Dutch possessions in Indian Seas	1,061,700	75,255	1,079,000	185,764
Dutch East Indies (except other Dutch possessions in Indian Seas)	1,678,800	107,464	2,044,300	356,043
Other countries in East Indies and Pacific, not elsewhere specified	80,900	5,930	176,200	28,520
Brazil	1,094,500	68,598	1,046,300	189,993
Peru	.....	.....	.....	.....
South and Central America (Except Brazil and Peru)	.....	.....	3,600	55,500
West Africa				
French West Africa	150,700	7,561	567,600	71,996
Gold Coast	10,500	587	53,900	6,523
Other parts of West Africa	165,200	8,473	271,200	35,896
East Africa, including Madagascar	118,900	8,472	129,300	18,370
Other countries	89,100	6,652	205,600	36,314
Totals	14,759,200	£986,597	25,777,900	£4,579,705
Waste and reclaimed rubber	459,500	£5,341	1,012,800	£17,975
Gutta percha and balata	1,072,800	145,674	789,400	122,155
Rubber substitutes	1,100	31	13,500	487
Totals	1,533,400	£151,046	1,815,700	£140,617
Manufactured				
Boots and shoes....*doz. pairs*	23,177	£71,784	34,415	£70,290
Tires and tubes				
Pneumatic				
Outer covers	.....	£199,032	.....	£291,293
Inner tubes	.....	33,972	.....	36,072
Solid tires	.....	30,751	.....	25,866
Other rubber manufactures	.....	121,970	.....	143,596
Totals	.....	£457,509	.....	£567,117

Exports

Unmanufactured Rubber				
Waste and reclaimed	1,289,600	£13,737	2,860,400	£41,768
Rubber substitutes	135,400	3,506	178,400	3,667
Totals	1,425,000	£17,243	3,038,800	£45,435
Manufactured				
Boots and shoes....*doz. pairs*	24,483	£35,649	16,454	£27,242
Tires and tubes				
Pneumatic				
Outer covers	.....	184,621	.....	242,250
Inner tubes	.....	44,041	.....	54,894
Solid tires	.....	33,930	.....	42,025
Other rubber manufactures	.....	252,020	.....	227,289
Totals	.....	£550,261	.....	£593,700

Exports—Colonial and Foreign

Unmanufactured	January, 1925		January, 1926	
Crude rubber				
To—	Pounds	Value	Pounds	Value
Russia	745,700	£54,342	743,300	£132,860
Sweden, Norway and Denmark	232,700	17,750	72,500	12,686
Germany	1,722,900	124,116	957,200	176,250
Belgium	536,900	41,424	126,400	23,350
France	3,256,800	255,023	1,814,400	361,125
Spain	50,900	4,043	70,200	12,512
Italy	1,607,700	123,709	953,200	195,279
Other European countries	371,500	24,386	94,000	19,170
United States	6,183,000	458,788	5,437,500	1,062,102
Canada	665,200	44,317	27,000	4,836
Other countries	21,200	1,757	58,200	11,572
Totals	15,394,500	£1,149,655	10,353,900	£2,011,742
Waste and reclaimed rubber	3,600	£87	14,600	£418
Gutta percha and balata	113,700	7,143	33,400	5,144
Rubber substitutes	.....	.....	.....	.....
Totals	117,300	£7,230	48,000	£5,562
Manufactured				
Boots and shoes....*doz. pairs*	393	£1,265	399	£1,946
Tires and tubes				
Pneumatic				
Outer covers	.....	35,081	.....	29,982
Inner tubes	.....	4,464	.....	4,578
Solid tires	.....	2,123	.....	1,316
Other rubber manufactures	.....	10,475	.....	5,128
Totals	.....	£53,408	.....	£42,950

Rubber Statistics for the Dominion of Canada

Imports of Crude and Manufactured Rubber

	December, 1925		Nine Months Ended December, 1925	
Unmanufactured	Pounds	Value	Pounds	Value
Rubber, gutta percha, etc.				
From United Kingdom	332,450	$194,159	2,475,388	$1,284,172
United States	3,769,966	3,527,588	25,242,935	17,371,126
Straits Settlements	713,035	558,180	4,286,847	2,420,725
Dutch East Indies	147,454	136,849	877,278	611,449
France	31,765	19,974	32,469	20,464
Other countries	38,083	28,633	161,383	90,817
Totals	5,032,753	$4,465,383	33,076,300	$21,798,753
Rubber, recovered	684,628	$69,119	5,727,923	$697,604
Rubber, powdered and rubber or gutta percha scrap	409,307	27,813	3,913,634	227,662
Balata	.....	.....	1,790	1,505
Rubber substitutes	.....	20,127	.....	78,335
Totals	1,093,935	$117,059	9,643,347	$1,005,106
Partly Manufactured				
Hard rubber sheets and rods	12,799	$11,425	205,488	$146,655
Hard rubber tubes	.....	229	.....	1,015
Rubber thread not covered	4,579	6,905	112,748	121,522
Totals	17,378	$18,559	318,236	$269,192
Manufactured				
Belting	.....	$14,787	.....	$172,012
Hose	.....	10,594	.....	129,512
Packing	.....	4,602	.....	34,941
Boots and shoes.....*pairs*	9,021	10,619	41,699	66,350
Clothing, including waterproofed	.....	8,540	.....	129,765
Gloves	.....	1,993	.....	12,444
Hot water bottles	.....	6,991	.....	16,996
Tires, solid.....*number*	59	2,441	872	32,627
Tires, pneumatic.....*number*	546	11,540	22,727	365,910
Inner tubes .....*number*	197	1,451	15,290	43,923
Elastic, round or flat	.....	14,082	.....	161,729
Mats and matting	.....	1,446	.....	16,241
Cement	.....	5,699	.....	40,853
Golf balls .....*dozen*	262	757	26,205	109,464
Heels, rubber .....*pairs*	22,462	987	119,063	8,757
Other rubber manufactures	.....	123,393	.....	1,126,705
Totals	.....	$219,922	.....	$2,468,229
Totals, rubber imports	.....	$4,820,923	.....	$25,541,280

Exports of Domestic and Foreign Rubber Goods

	December, 1925		Nine Months Ended December, 1925	
Unmanufactured	Produce of Canada Value	Re-exports of Foreign Goods Value	Produce of Canada Value	Re-exports of Foreign Goods Value
Crude and waste rubber	$74,266	.....	$310,976	.....
Totals	$74,266	.....	$310,976	.....
Manufactured				
Belting	$92,843	.....	$471,240	.....
Canvas shoes with rubber soles	174,613	.....	1,868,956	.....
Boots and shoes	162,435	.....	1,510,486	.....
Clothing, including waterproofed	2,049	.....	35,546	.....
Hose	22,500	.....	175,593	.....
Tires, casings	991,986	.....	7,568,875	.....
Inner tubes	201,675	.....	1,345,322	.....
Solid	31,500	.....	187,567	.....
Other rubber manufactures	58,185	$5,050	340,120	$107,720
Totals	$1,737,786	$5,050	$13,503,705	$107,720
Totals, rubber exports	$1,812,052	$5,050	$13,814,681	$107,720

Landings, Deliveries and Stocks in London and Liverpool as Returned by the Warehouses and Wharves During the Month of January, 1926

	Landed for January	Delivered for January	Stocks, January 31		
			1926	1925	1924
London:	Tons	Tons	Tons	Tons	Tons
Plantation	10,294	6,012	9,865	27,005	*57,112
Other grades	47	10	73	84	97
Liverpool:					
Plantation	†745	†330	†818	†2,579	†5,549
Pará and Peruvian	185	113	288	172	593
Other grades	....	1	11	59	210
Total tons London and Liverpool	11,271	6,466	11,055	29,899	63,561

* Adjusted for rubber destroyed by fire at Concordia wharf.
† Official returns from the six recognized public warehouses.

Official India Rubber Statistics for the United States

Imports of Crude and Manufactured Rubber

	January, 1926		Seven Months Ended January, 1926	
UNMANUFACTURED—*Free*	Pounds	Value	Pounds	Value
Crude rubber	94,985,456	$72,528,151	554,115,708	$354,105,404
Balata	135,304	44,479	900,272	484,855
Jelutong or Pontianak	420,694	71,004	7,508,847	868,742
Gutta percha	252,819	54,147	2,388,823	448,435
Guayule	637,329	189,551	5,742,994	1,385,150
Rubber scrap	4,262,422	180,802	22,154,823	812,982
Totals	100,694,024	$73,068,134	592,811,467	$358,105,568
Chicle *dutiable*	1,389,081	$669,190	6,301,744	$3,053,751
MANUFACTURED—*dutiable*				
Rubber belting	53,529	$38,298	402,520	$301,063
Rubber tires	791	13,049	791	13,049
Other rubber manufactures or substitutes for rubber	.....	105,534	.....	866,190
Totals	54,320	$156,881	403,311	$1,180,302

Exports of Foreign Merchandise

RUBBER AND MANUFACTURES				
Crude rubber	4,668,304	$3,747,505	22,162,045	$16,837,284
Balata	31,649	19,200	235,907	136,139
Gutta percha and rubber substitutes and scrap	.....	.....	12,687	7,500
Rubber manufactures	.....	479	.....	146,969
Totals	4,699,953	$3,767,184	22,410,639	$17,127,892
Chicle	.....	.....	43,467	$18,701

Exports of Domestic Merchandise

	January, 1926		Seven Months Ended January, 1926	
MANUFACTURED	Pounds	Value	Pounds	Value
India rubber				
Reclaimed	986,026	$144,937	6,626,879	$778,370
Scrap and old	2,301,129	200,807	15,937,345	1,084,163
Footwear				
Boots *pairs*	84,125	239,800	643,767	1,485,320
Shoes *pairs*	92,356	70,518	847,852	741,074
Canvas shoes with rubber soles *pairs*	347,340	273,060	2,642,543	1,891,550
Rubber water bottles and fountain syringes *number*	20,427	13,704	195,689	144,599
Rubber gloves *doz. prs.*	3,718	14,420	3,718	14,420
Other druggists' rubber sundries	.....	$47,576	.....	$739,448
Bathing caps *dozen*	8,994	25,088	52,602	113,832
Hard rubber goods				
Electrical hard rubber goods	37,695	23,559	692,676	232,740
Other hard rubber goods	.....	38,001	.....	304,889
Tires				
Casings, automobile *number*	123,465	1,933,594	947,854	13,561,345
Tubes, automobile *number*	87,162	251,362	838,652	1,981,819
Other casings and tubes *number*	7,986	27,647	46,648	146,610
Solid tires				
For automobiles and motor trucks *number*	9,632	334,404	67,184	2,099,083
Others	179,451	60,581	1,300,936	361,361
Tire accessories	.....	110,347	.....	749,569
Rubber and friction tape	42,438	15,704	42,438	15,704
Belting	273,198	188,516	2,363,219	1,476,206
Hose	473,412	199,790	3,194,811	1,296,048
Packing	148,347	75,138	1,265,948	592,995
Soles and heels	372,259	119,325	2,191,983	691,875
Thread	284,757	382,964	1,123,860	1,411,488
Rubber bands and erasers	40,508	33,420	40,508	33,420
Other rubber manufactures	.....	195,719	.....	1,241,407
Totals	.....	$5,019,981	.....	$33,189,335
Rubber toys, balls and balloons	.....	$81,488	.....	$673,627

Imports of Crude Rubber Into the United States by Customs Districts

	January, 1925		*January, 1926	
	Pounds	Value	Pounds	Value
Massachusetts	3,061,520	$914,049	5,507,022	$4,441,939
Buffalo	.....	.....	30,000	12,600
New York	65,582,742	20,122,938	87,137,455	66,223,989
Philadelphia	902,876	267,057	.....	.....
Maryland	1,288,004	330,890	.....	.....
New Orleans	.....	.....	697	174
Los Angeles	2,361,201	624,485	1,834,898	1,456,833
San Francisco	238,104	73,438	228,984	180,824
Colorado	246,400	70,288	.....	.....
Washington	11,200	3,611	246,400	211,792
	73,692,047	$22,406,756	94,985,456	$72,528,151

*Including Latex Dry Rubber Content.

Plantation Rubber Exports from Dutch East Indies

Java and Madura

	October		Ten Months Ended October	
To—	1924 Kilos	1925 Kilos	1924 Kilos	1925 Kilos
Holland	112,000	117,000	2,045,000	1,621,000
Holland for order	51,000	209,000	870,000	1,930,000
Great Britain	424,000	477,000	5,585,000	5,847,000
Great Britain for order	.....	69,000	64,000	389,000
Germany and for order	47,000	126,000	317,000	1,320,000
France and for order	1,000	108,000	251,000	577,000
Belgium and for order	11,000	8,000	25,000	183,000
Italy and for order	25,000	40,000	314,000	552,000
Sweden	.....	.....	.....	3,000
United States and for order	2,115,000	1,965,000	22,902,000	23,524,000
South America	.....	.....	.....	202,000
Singapore	171,000	217,000	2,321,000	1,390,000
Hongkong	.....	.....	27,000	3,000
Japan	10,000	.....	697,000	68,000
Australia	4,000	71,000	243,000	662,000
Other countries	4,000	.....	4,000	3,000
Totals	2,975,000	3,407,000	35,665,000	38,274,000
Ports of Origin:				
Tandjong-Priok	1,144,000	1,724,000	13,707,000	16,264,000
Cheribon	.....	8,000	56,000	42,000
Samarang	214,000	241,000	2,561,000	2,838,000
Sourabaya	1,205,000	1,153,000	14,309,000	13,719,000
Pasuruan	42,000	67,000	1,045,000	952,000
Probolinggo	61,000	15,000	1,007,000	798,000
Panarukan	138,000	.....	1,220,000	.....
Banjuwangi	100,000	78,000	808,000	875,000
Tjilatjap	70,000	120,000	951,000	1,211,000

Belawan

	October		Ten Months Ended October	
To—	1924 Kilos	1925 Kilos	1924 Kilos	1925 Kilos
Holland	91,000	70,000	1,461,000	1,748,000
Great Britain	554,000	746,000	4,013,000	6,160,000
Germany	15,000	55,000	293,000	465,000
France	.....	120,000	236,000	458,000
Italy	5,000	41,000	222,000	347,000
Belgium	.....	.....	27,000	14,000
United States	2,919,000	2,511,000	24,755,000	17,420,000
Canada	.....	.....	.....	9,000
South Africa	.....	.....	.....	14,000
Singapore	89,000	72,000	802,000	860,000
Penang	140,000	234,000	843,000	1,750,000
Hongkong	.....	.....	.....	10,000
Australia	3,000	17,000	20,000	94,000
Other countries	8,000	.....	127,000	.....
Totals	3,824,000	3,966,000	32,799,000	29,349,000

United States Crude and Waste Rubber Imports for 1926 (By Months)

	Plantations	Parás	Africans	Centrals	Guayule	Manicobas and Matto Grosso	Total 1926	Total 1925	Balata	Miscellaneous	Waste
January *tons*	36,372	856	791	515	153	10	38,697	29,960	94	607	1,227
February	31,832	1,548	227	250	204	6	34,067	23,456	19	728	729
Totals, 2 months, 1926 *tons*	68,204	2,404	1,018	765	357	16	72,764	.....	113	1,335	1,956
Totals, 2 months, 1925	50,220	2,192	445	278	275	6	.....	53,416	70	2,370	447

Compiled from statistics supplied by the Rubber Association of America, Inc.

AMERICAN IMPORTS OF CRUDE RUBBER HAVE ADVANCED IN QUANTITY from a total for the year 1923 of 692,483,377 pounds to 735,980,070 pounds for 1924, and 888,478,385 pounds for 1925. Values for these three years have been respectively $185,060,304, $174,244,917, and $429,705,014.

CANADA REPRESENTED THE CHIEF MARKET DURING THE PAST year for rubber tire accessories and repair materials, taking American goods valued at $184,439; Australia's share being $120,194; Argentina following with $108,178, and the United Kingdom $104,575.

Crude Rubber Arrivals at New York as Reported by Importers

Parás and Caucho

	Fine Cases	Medium Cases	Coarse Cases	Caucho Cases	Cametá Cases
February 15. By "Bermin," South America.					
H. A. Astlett & Co., Inc.	385	13	55	1	....
February 24. By "Cuthbert," South America.					
H. A. Astlett & Co., Inc.	231	....	108	....	....
General Rubber Co.	582	4	297	121	37
L. Littlejohn & Co., Inc.	870	....	147	475	....
Meyer & Brown, Inc.	740	....	92	130	....
Poel & Kelly, Inc.	31	....	395	131	....
March 13. By "Hubert," South America.					
General Rubber Co.	556	14	135	220	....
L. Littlejohn & Co., Inc.	840	3	377	278	....
Meyer & Brown, Inc	158	....	135	....	....

Plantations

	Cases
February 13. By "Pres. Van Buren," Far East.	
H. A. Astlett & Co., Inc.	912
Haldane Bierrie & Co., Inc.	100
February 14. By "Lucerie," Far East.	
Poel & Kelly, Inc.	446
February 15. By "Antonia," Far East.	
H. A. Astlett & Co.	153
Poel & Kelly, Inc.	1,621
February 16. By "Dacre Castle," Far East.	
H. A. Astlett & Co., Inc.	400
General Rubber Co.	5,079
Haldane Bierrie & Co., Inc.	500
Meyer & Brown, Inc.	1,593
Poel & Kelly, Inc.	*450
Poel & Kelly, Inc.	1,541
Raw Products Co.	208
February 16. By "London Exchange," London.	
Meyer & Brown, Inc.	1,124
February 17. By "American Banker," London.	
H. A. Astlett & Co., Inc.	370
General Rubber Co.	1,175
L. Littlejohn & Co., Inc.	1,866
Meyer & Brown, Inc.	50
Chas. T. Wilson Co., Inc.	33
February 17. By "Medan," Far East.	
H. A. Astlett & Co., Inc.	1,575
General Rubber Co.	5,026
Haldane Bierrie & Co., Inc.	85
Hood Rubber Co.	*268
L. Littlejohn & Co., Inc.	2,538
Meyer & Brown, Inc.	1,621
Meyer & Brown, Inc.	*55
Poel & Kelly, Inc.	530
Poel & Kelly, Inc.	*194
Raw Products Co.	373
Chas. T. Wilson Co., Inc.	210
February 17. By "Thuringia," Hamburg.	
H. Muehlstein & Co., Inc.	56
February 20. By "Binnendyk," Rotterdam.	
General Rubber Co.	127
L. Littlejohn & Co., Inc.	348
February 20. By "Keemun," Far East.	
H. A. Astlett & Co., Inc.	733
Baird Rubber & Trading Co., Inc.	1,609
General Rubber Co.	5,210
Haldane Bierrie & Co., Inc.	200
Hood Rubber Co.	*380
L. Littlejohn & Co., Inc.	9,975
Meyer & Brown, Inc.	3,628
H. Muehlstein & Co., Inc.	1,140
Poel & Kelly, Inc.	2,343
Raw Products Co.	149
Chas. T. Wilson Co., Inc.	701
February 21. By "Arabic," Germany.	
Haldane Bierrie & Co., Inc.	93
February 22. By "Montpelier," Germany.	
Haldane Bierrie & Co., Inc.	69
L. Littlejohn & Co., Inc.	152
Raw Products Co.	114
February 23. By "Minnewaska," London.	
H. A. Astlett & Co., Inc.	318
General Rubber Co.	6,401
L. Littlejohn & Co., Inc.	535
Poel & Kelly, Inc.	907
Chas. T. Wilson Co., Inc.	22
February 23. By "Siberay," Far East.	
Poel & Kelly, Inc.	*65
February 23. By "Volendam," Europe.	
H. A. Astlett & Co., Inc.	55
L. Littlejohn & Co., Inc.	344
Meyer & Brown, Inc.	56
February 24. By "Caronia," London.	
Chas. T. Wilson Co., Inc.	47
February 24. By "Tuscania," London.	
Poel & Kelly, Inc.	64
February 25. By "City of Evansville," Far East.	
H. A. Astlett & Co., Inc.	826
Baird Rubber & Trading Co., Inc.	2,216
General Rubber Co.	4,840
Haldane Bierrie & Co., Inc.	250
Hood Rubber Co.	*310
L. Littlejohn & Co., Inc.	3,400
Meyer & Brown, Inc.	1,588
H. Muehlstein & Co., Inc.	480
Poel & Kelly, Inc.	2,079
Poel & Kelly, Inc.	*100
Raw Products Co.	360
Chas. T. Wilson Co., Inc.	510
February 25. By "City of Melbourne," Far East.	
Meyer & Brown, Inc.	127
February 26. By "City of Durban," Far East.	
H. A. Astlett & Co., Inc.	763
Baird Rubber & Trading Co., Inc.	610
General Rubber Co.	2,510
L. Littlejohn & Co., Inc.	5,112
Meyer & Brown, Inc.	2,921
Meyer & Brown, Inc.	*50
H. Muehlstein & Co., Inc.	350
Poel & Kelly, Inc.	2,768
Poel & Kelly, Inc.	*100
Raw Products Co.	128
Chas. T. Wilson Co., Inc.	96
February 26. By "Siberian Prince," Far East.	
H. A. Astlett & Co., Inc.	556
H. A. Astlett & Co., Inc.	*96
Baird Rubber & Trading Co., Inc.	879
General Rubber Co.	4,487
Haldane Bierrie & Co., Inc.	54
Hood Rubber Co.	*514
L. Littlejohn & Co., Inc.	4,378
Meyer & Brown, Inc.	2,054
H. Muehlstein & Co., Inc.	612
Poel & Kelly, Inc.	1,557
Poel & Kelly, Inc.	*141
Raw Products Co.	218
Chas. T. Wilson Co., Inc.	637
February 26. By "Steel Scientist," Far East.	
H. A. Astlett & Co., Inc.	351
Baird Rubber & Trading Co., Inc.	221
General Rubber Co.	8,992
Hood Rubber Co.	*622
Hood Rubber Co.	144
L. Littlejohn & Co., Inc.	4,605
Meyer & Brown, Inc.	1,776
H. Muehlstein & Co., Inc.	270
Poel & Kelly, Inc.	2,933
Poel & Kelly, Inc.	*200
Raw Products Co.	510
Chas. T. Wilson Co., Inc.	256
February 26. By "Vardulia," London.	
Baird Rubber & Trading Co., Inc.	146
L. Littlejohn & Co., Inc.	338
Chas. T. Wilson Co., Inc.	122
February 27. By "City of Benares," Far East.	
General Rubber Co.	73
L. Littlejohn & Co., Inc.	937
Meyer & Brown, Inc.	34
Poel & Kelly, Inc.	144
Raw Products Co.	334
Chas. T. Wilson Co., Inc.	164
February 27. By "Pres. Hayes," Far East.	
H. A. Astlett & Co., Inc.	*100
H. A. Astlett & Co., Inc.	467
Baird Rubber & Trading Co., Inc.	*600
Baird Rubber & Trading Co., Inc.	1,800
General Rubber Co.	2,732
Haldane Bierrie & Co., Inc.	48
Hood Rubber Co.	*85
L. Littlejohn & Co., Inc.	2,966
Meyer & Brown, Inc.	1,562
H. Muehlstein & Co., Inc.	854
Poel & Kelly, Inc.	*450
Poel & Kelly, Inc.	825
Raw Products Co.	922
Chas. T. Wilson Co., Inc.	866
March 2. By "Ascania," Far East	
General Rubber Co.	1,163
Poel & Kelly, Inc.	847
Raw Products Co.	50
March 2. By "President Lincoln," Far East.	
Poel & Kelly, Inc.	†150
March 3. By "Alaunia," London.	
Poel & Kelly, Inc.	37
Chas. T. Wilson Co., Inc.	50
March 3. By "American Shipper," London.	
General Rubber Co.	2,113
L. Littlejohn & Co., Inc.	538
Meyer & Brown, Inc.	1,098
Chas. T. Wilson Co., Inc.	72
March 3. By "Fuji Maru," Far East.	
H. A. Astlett & Co., Inc.	275
H. A. Astlett & Co., Inc.	*79
Baird Rubber & Trading Co., Inc.	449
General Rubber Co.	2,562
Hood Rubber Co.	*320
L. Littlejohn & Co., Inc.	2,023
Meyer & Brown, Inc.	2,400
H. Muehlstein & Co., Inc.	40
Poel & Kelly, Inc.	120
Raw Products Co.	318
Chas. T. Wilson Co., Inc.	120
March 3. By "Matheran," London.	
General Rubber Co.	2,008
L. Littlejohn & Co., Inc.	1,099
Meyer & Brown, Inc.	1,551
H. Muehlstein & Co., Inc.	321
March 4. By "City of Salisbury," Far East.	
H. A. Astlett & Co., Inc.	48
L. Littlejohn & Co., Inc.	262
Meyer & Brown, Inc.	28
Poel & Kelly, Inc.	75
March 4. By "Tymeric," Far East.	
Baird Rubber & Trading Co., Inc.	75
General Rubber Co.	208
L. Littlejohn & Co., Inc.	88
Meyer & Brown, Inc.	53
Poel & Kelly, Inc.	11
March 5. By "President Cleveland," Far East.	
H. A. Astlett & Co., Inc.	†394
Baird Rubber & Trading Co., Inc.	†250
H. Muehlstein & Co., Inc.	38
March 5. By "Stadsdyk," Far East.	
H. A. Astlett & Co., Inc.	*102
H. A. Astlett & Co., Inc.	352
Baird Rubber & Trading Co., Inc.	54
General Rubber Co.	4,489
Haldane Bierrie & Co., Inc.	318
Hood Rubber Co.	*135
L. Littlejohn & Co., Inc.	3,658
Meyer & Brown, Inc.	308
H. Muehlstein & Co., Inc.	355
Poel & Kelly, Inc.	*392
Poel & Kelly, Inc.	569
Raw Products Co.	63
Chas. T. Wilson Co., Inc.	165
March 5. By "Vechtdyk," Far East.	
General Rubber Co.	117
L. Littlejohn & Co., Inc.	233
March 5. By "West Sequana," Far East.	
Baird Rubber & Trading Co., Inc.	†490
Poel & Kelly, Inc.	†600
March 6. By "Nevisian," Europe.	
H. A. Astlett & Co., Inc.	*200
March 6. By "New Amsterdam," Hamburg.	
Raw Products Co.	65
March 9. By "City of Lincoln," Far East.	
H. A. Astlett & Co., Inc.	468
Baird Rubber & Trading Co., Inc.	1,486
General Rubber Co.	904
Haldane Bierrie & Co., Inc.	198
L. Littlejohn & Co., Inc.	3,773
Meyer & Brown, Inc.	1,309
Meyer & Brown, Inc.	*260
H. Muehlstein & Co., Inc.	156
Poel & Kelly, Inc.	1,448
Poel & Kelly, Inc.	*500
Raw Products Co.	415
Chas. T. Wilson Co., Inc.	428
March 9. By "Menominee," Far East.	
H. A. Astlett & Co., Inc.	207
March 10. By "American Farmer," London.	
H. A. Astlett & Co., Inc.	125
General Rubber Co.	2,858
L. Littlejohn & Co., Inc.	996
Meyer & Brown, Inc.	178
Poel & Kelly, Inc.	50
Chas. T. Wilson Co., Inc.	421
March 10. By "Madioen," Far East.	
H. A. Astlett & Co., Inc.	306
Baird Rubber & Trading Co., Inc.	412
General Rubber Co.	6,094
L. Littlejohn & Co., Inc.	953
Meyer & Brown, Inc.	1,050
H. Muehlstein & Co., Inc.	723
Poel & Kelly, Inc.	1,644
Chas. T. Wilson Co., Inc.	199
March 10. By "Mahseer," Far East.	
L. Littlejohn & Co., Inc.	2,763
Meyer & Brown, Inc.	762
March 11. By "President Polk," Far East.	
H. A. Astlett & Co., Inc.	314
H. A. Astlett & Co., Inc.	*81
Baird Rubber & Trading Co., Inc.	1,600
Baird Rubber & Trading Co., Inc.	*160
General Rubber Co.	2,907
Haldane Bierrie & Co., Inc.	96
L. Littlejohn & Co., Inc.	3,107
Meyer & Brown, Inc.	1,076
H. Muehlstein & Co., Inc.	304
Poel & Kelly, Inc.	1,096
Raw Products Co.	360
Chas. T. Wilson Co., Inc.	482
March 11. By "Verbania," Far East.	
Poel & Kelly, Inc.	479

*Arrived at Boston.
†Arrived at Los Angeles.
‡Scrap.
§Arrived at Laredo, Texas.

	Cases
MARCH 12. By "City of Dunedin," Far East.	
General Rubber Co.	172
L. Littlejohn & Co., Inc.	483
Meyer & Brown, Inc.	38
Chas. T. Wilson Co., Inc.	178
MARCH 12. By "Lowther Castle," Far East.	
H. A. Astlett & Co., Inc.	*150
H. A. Astlett & Co., Inc.	320
Baird Rubber & Trading Co., Inc.	646
General Rubber Co.	9,744
L. Littlejohn & Co., Inc.	5,447
Meyer & Brown, Inc.	1,593
H. Muehlstein & Co., Inc.	60
Poel & Kelly, Inc.	*1,159
Raw Products Co.	155
MARCH 13. By "Patrick Henry," Far East.	
Baird Rubber & Trading Co., Inc.	556
General Rubber Co.	97
L. Littlejohn & Co., Inc.	705
Meyer & Brown, Inc.	1,296
Chas. T. Wilson Co., Inc.	150
MARCH 13. By "Weirbank," Far East.	
Baird Rubber & Trading Co., Inc.	667
General Rubber Co.	582
L. Littlejohn & Co., Inc.	3,930
Meyer & Brown, Inc.	2,055
Meyer & Brown, Inc.	*30
H. Muehlstein & Co., Inc.	200
Poel & Kelly, Inc.	*49
Chas. T. Wilson Co., Inc.	126
MARCH 26. By "Ansonia," London.	
General Rubber Co.	238
MARCH 16. By "Pittsburg," Antwerp.	
Baird Rubber & Trading Co., Inc.	102
Raw Products Co.	575

Africans

	Cases
FEBRUARY 16. By "Antonia," France.	
H. Muehlstein & Co., Inc.	51
FEBRUARY 17. By "India Maru," Europe.	
L. Littlejohn & Co., Inc.	355
FEBRUARY 23. By "Deutschland," Europe.	
L. Littlejohn & Co., Inc.	135

	Cases
FEBRUARY 24. By "Caronia," Europe.	
L. Littlejohn & Co., Inc.	74
FEBRUARY 26. By "Vardulia," London.	
H. Muehlstein & Co., Inc.	48
FEBRUARY 26. By "Burgondier," Europe.	
L. Littlejohn & Co., Inc.	294
MARCH 3. By "Alaunia," Europe.	
L. Littlejohn & Co., Inc.	23
MARCH 7. By "Kofuku Maru," Europe.	
L. Littlejohn & Co., Inc.	169
MARCH 9. By "Carmania," Europe.	
L. Littlejohn & Co., Inc.	47
MARCH 9. By "Celtic," Europe.	
L. Littlejohn & Co., Inc.	20
MARCH 10. By "Andania," Europe.	
L. Littlejohn & Co., Inc.	201
MARCH 13. By "Collamer," Europe.	
L. Littlejohn & Co., Inc.	881

Balata

	Cases
FEBRUARY 20. By "Prins Fred'k Hendrik."	
Dutch Guiana.	
Middleton & Co., Ltd.	Bales 37

Guayule

	Cases
FEBRUARY 20 to MARCH 13. By "Railways," Mexico.	
Continental Rubber Co. of New York	17,600

Maniçobas

FEBRUARY 24. By "Cuthbert," Brazil.	
General Rubber Co.	Cases 2
MARCH 1. By "Sardinian Prince," Bahia.	
Adolph Hirsch & Co., Inc.	bales 17
MARCH 13. By "Hubert," Brazil.	
General Rubber Co.	8

Penang Sheet

	Cases
FEBRUARY 13. By "President Van Buren," Far East.	
Hood Rubber Co.	*84
FEBRUARY 15. By "Liberty," Havre.	
Poel & Kelly, Inc.	bales 136
FEBRUARY 17. By "Medan," Far East.	
Hood Rubber Co.	*107
Poel & Kelly, Inc.	*472
FEBRUARY 22. By "Sarcoxie," Bordeaux.	
Poel & Kelly, Inc.	bales 224
FEBRUARY 26. By "City of Durban," Far East.	
Poel & Kelly, Inc.	bales *101
FEBRUARY 26. By "Siberian Prince," Singapore.	
Baird Rubber & Trading Co., Inc.	‡*304
Poel & Kelly, Inc.	bales 198
MARCH 5. By "Stadsdyk," Far East.	
Baird Rubber & Trading Co., Inc.	107
Baird Rubber & Trading Co., Inc.	*95
Hood Rubber Co.	*26
Poel & Kelly, Inc.	bales *55
MARCH 9. By "City of Lincoln," Far East.	
Poel & Kelly, Inc.	bales 113
MARCH 10. By "Madioen," Singapore.	
Baird Rubber & Trading Co., Inc.	*48
Baird Rubber & Trading Co., Inc.	115
Poel & Kelly, Inc.	bales 95

Rubber Latex

	Gallons
FEBRUARY 17. By "Dacre Castle," Far East.	
General Rubber Co.	88,832
FEBRUARY 26. By "Steel Scientist," Far East.	
General Rubber Co.	67,447
MARCH 5. By "Stadsdyk," Far East.	
General Rubber Co.	36,384
MARCH 9. By "Madioen," Far East.	
General Rubber Co.	18,918
MARCH 13. By "Patrick Henry," Far East.	
General Rubber Co.	135,716
MARCH 14. By "Lowther Castle," Far East.	
General Rubber Co.	27,966

Exports of Rubber Caucho and Balata from the Amazons During 1925

EXPORTERS	EUROPE Fine Kilos	Medium Kilos	Coarse Kilos	Caucho Kilos	Balata Kilos	Total Kilos	AMERICA Fine Kilos	Medium Kilos	Coarse Kilos	Caucho Kilos	Balata Kilos	Total Kilos	Grand Total Kilos
Berringer & Co., Pará-Manáos.	1,297,870	120,698	78,545	358,890	215,821	2,071,824	1,878,544	49,586	653,592	1,831,906	56,618	4,470,246	6,542,070
General Rubber Co. of Brazil—Pará-Manáos	789,160	64,947	69,576	142,418	.....	1,066,101	2,073,522	212,187	713,605	1,340,930	53,341	4,393,585	5,459,686
J. G. Araujo & Co., Ltda.—Manáos	533,388	35,717	43,629	139,930	388,336	1,141,000	1,461,361	116,838	263,412	492,199	13,840	2,347,650	3,488,650
F. Chamié—Pará	8,120	.....	.....	.....	.....	8,120	1,068,338	13,740	678,118	38,699	.....	1,798,895	1,807,015
Ranniger & Co.—Para—Semper & Co.—Manáos	834,429	31,942	132,906	110,782	1,140	1,111,199	170,051	28,878	95,267	134,428	15,880	444,504	1,555,703
Saurez Filho & Co.—Pará	726,560	.....	.....	.....	.....	726,560	391,149	4,212	9,190	262,978	.....	667,529	1,394,089
S. Bitar, Irmãos—Pará	292,301	31,427	104,382	108,096	.....	536,206	455,064	25,914	107,785	162,633	.....	751,396	1,287,602
Suter, Baumann & Co.—Pará-Manáos	223,115	20,152	15,949	221,875	53,325	534,416	213,870	10,778	84,553	91,447	997	401,645	936,061
Lyra & Co—Manáos	420,008	93,088	94,351	124,513	.....	731,960	49,470	.....	43,111	36,480	.....	129,061	861,021
Companhia Fluvial—Manáos	178,118	14,905	28,842	340,146	.....	562,011	93,326	6,481	13,269	47,363	.....	160,439	722,450
Adelbert H. Alden, Ltd.—Pará-Manáos	461,952	31,185	73,743	47,317	.....	614,197	.....	.....	.....	.....	.....	.....	614,197
Jos. Origet & Co.—Pará	48,425	2,590	1,506	298,280	.....	350,801	.....	.....	.....	.....	.....	.....	350,801
Ferreira Costa & Co.—Pará	.....	.....	.....	.....	.....	.....	74,900	4,583	6,642	161,698	.....	247,823	247,823
The Amazon River Steam Navigation Co. (1911), Ltd.—Pará	119,163	3,352	29,688	72,489	.....	224,692	.....	.....	.....	.....	.....	.....	224,692
B. Levy & Co.—Manáos	.....	.....	.....	.....	.....	.....	114,835	3,968	29,051	27,958	12,513	188,325	188,325
Holden & Co.—Pará	.....	.....	.....	.....	.....	.....	97,075	8,646	5,157	3,633	.....	114,511	114,511
Higson, Jones & Co.—Manáos	44,564	2,316	1,063	14,128	100	62,171	9,076	398	47	.....	.....	9,521	71,692
Teixeira & Co.—Pará	.....	.....	.....	.....	.....	.....	15,810	.....	.....	30,600	.....	46,410	46,410
Wilson, Holgate & Co. (Brazil), Ltd.—Pará	21,080	.....	.....	.....	.....	21,080	.....	.....	.....	.....	.....	.....	21,080
Sundry	4,930	.....	.....	.....	.....	4,930	23,643	.....	5,280	5,250	.....	34,173	39,103
Total from Pará and Manáos	6,003,183	452,319	674,180	1,978,864	658,722	9,767,268	8,190,034	486,209	2,708,079	4,668,202	153,189	16,205,713	25,972,981
From Iquitos	2,241	958	667	5,384	1,305,902	1,315,152	23,783	175,639	8,374	38,482	217,409	463,687	1,778,839
Grand total from the Amazons	6,005,424	453,277	674,847	1,984,248	1,964,624	11,082,420	8,213,817	661,848	2,716,453	4,706,684	370,598	16,669,400	27,751,820

Destinations

	United States Kilos	England Kilos	Germany Kilos	France Kilos	Brazil Kilos	Italy Kilos	Belgium Kilos	Holland Kilos	Argentina Kilos	Totals Kilos
From Pará	6,150,599	1,176,972	1,359,969	1,465,691	232,004	80,189	15,878	10,540	6,460	10,498,302
Manáos	9,793,878	3,525,423	1,657,552	395,604	22,607	.....	42,700	36,750	165	15,474,679
Iquitos	463,687	574,590	328,661	406,892	.....	.....	5,009	.....	....	1,778,839
Totals.....*kilos*	16,408,164	5,276,985	3,346,182	2,268,187	254,611	80,189	63,587	47,290	6,625	27,751,820

Compiled by Berringer, Ohliger & Co., Pará, Brazil.

A GREAT INCREASE IS SHOWN IN RECENT YEARS IN THE STATISTICS regarding American tire and tube exports to France and Germany. In the case of both countries such shipments are more than five fold greater in value in 1925 than in 1923, the totals being: France, 1923, $90,135; 1925, $530,121; Germany, 1923, $58,572; 1925, $348,692. It should be noted, however, that the corresponding figures for 1922 were: France, $289,946; Germany, $12,932.

AMERICAN EXPORTS OF RUBBER HOSE HAVE RISEN DURING THE PAST three years from 4,455,502 pounds in 1923 to 5,348,859 in 1925, the 1924 figures showing a slight decline to 4,422,819 pounds. During these three years the United Kingdom remained the chief market, taking in 1923, 729,492 pounds; in 1924, 727,741 pounds; and in 1925, 1,040,463 pounds. Other important customers were: Mexico, Cuba, British South Africa, Canada, Australia, Japan, Argentina, and Chile.

INDIA RUBBER WORLD
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Vol. 74 April 1, 1926 No. 1

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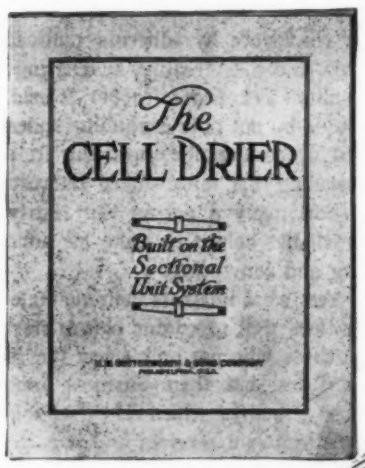
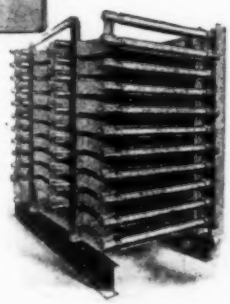
The Efficiency of the Butterworth Cell Drier has led 36 of the largest Tire Makers in the World to adopt it





The names of these tire concerns are listed with some (not all) of the other users in our book "The Cell Drier." We would like to send you a copy. Then you could see how, with a Butterworth Cell Drier, you heat only the drying surface that you need and why the Butterworth Cell Drier heats up evenly. "The Cell Drier" is really sixteen pages of information which you should have handy. We'll have a copy in your hands within a couple of days—that is if you write *now*.

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Aging Machines	Mercerizing Ranges	Mangles (all kinds)
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NOISE *or nothing—*

THERE are times when it seems that a radio gets either every bit of noise in the air or none at all. Something's wrong then, of course. The static interference is not so hard to cut out, but you're generally in for an evening when an eloquent silence follows much turning of variable knobs and wiggling of wires. Yet how simple is the fixing when you do find the trouble!

Now and then, things go wrong like that with rubber mixes. The trouble might be anywhere, and many times the use of an unsuitable mineral rubber is the cause.

Then the remedy is simple, too. Tune in on RMR (Robertson Mineral Rubber) and watch the reception it gets from the other compounding ingredients. It doesn't interfere with them in any way, except to mix well, easily and quickly. It's pure, and never variable in quality—you get it that way in any volume.

RMR is a sort of amplifier in effecting beneficial results in any rubber compound in which it is used. It's a good hook-up—try a small order yourself and see if it isn't!

H. H. ROBERTSON COMPANY
Pittsburgh, Pa.

Factories: Ambridge, Pa., Sarnia, Ont.
Branch Offices: In all principal cities in the United States.
For Europe and Australia: Sales Agents, Beahan & Sainsbury, 4 Mincing Lane, London, E. C., 3, England.
For Canada: H. H. Robertson Co., Ltd., Sarnia. General Sales Agents for Canada, Garnet Lea, 289-291 Sumach St., Toronto, Ont., Canada.

ROBERTSON MINERAL RUBBER RMR

Our Publicity Page

Cooperating With Advertisers

THERE is no ethical relation more keenly appreciated by fair-minded publishers than their obligation to cooperate with their advertisers in promoting trade in every proper way; and it is gratifying to note that this duty is becoming increasingly recognized by directors of trade journals. The harmonious cooperation of editorial and advertising policy which characterizes a progressive trade publication is assurance to every advertiser that his interests are being constantly advanced.

The India Rubber World Policy

Ever since it issued its first number in 1889, *The India Rubber World* has not only deemed it its duty to furnish its readers with the latest and most comprehensive general information about the rubber industry, but it has always taken special efforts to let its readers know what new machines, materials, and processes would best meet their needs. Requests come daily from all over the world for advice or direction, and the questioners are promptly given the names of those who can supply their requirements—to the mutual advantage of both sides.

Earning Advertisers' Support

The India Rubber World has not only won the unceasing interest of its readers by supplying them with a vast amount of helpful information, but it has earned their implicit confidence because of the pains which it has always taken to verify news items before they are printed; and this, coupled with absolute impartiality, has built up for it an international reputation for integrity that *The India Rubber World* prizes as its greatest asset.

While exacting as to the quality of its news, editorials, special articles, and like features, this journal has been quite as particular as to the quality of the advertising admitted into its pages, with the result that readers have properly come to put exceptional confidence in the representations and claims made by advertisers who utilize the display columns of *The India Rubber World*.

How Advertisers Are Helped

Having won reader confidence by adhering unflinchingly to the highest standards, and thus creating advertising value of the most prime quality, *The India Rubber World* jealously conserves that value by not only excluding undesirable advertising matter, but by continually improving its advertising contents. In making the latter more interesting it helps the advertiser; and many a patron can testify how expert aid from our staff has helped to make his announcements more captivating and convincing.

As publishers know best what interests their clientele most, the shrewd advertiser does well to confer before starting a selling campaign with those who not only select the reading matter of their subscribers, but their business announcements as well. This is a field in which *The India Rubber World* can render most valuable service; and it is free.

Just tell us your problems.

When to Advertise

The best time to advertise is all the time. It is a logical fact that shrewd men in the rubber and allied trades advertise first in *The India Rubber World*, and whenever possible, patronize their fellow advertisers. They realize that in so doing the entire trade is reached at minimum expense because there is no waste circulation to pay for, and the integrity of the publisher gives faith in the character of the other advertisers. They find most leading firms continuously represented, and experience soon convinces them that advertising pays.

The printed word carries a far greater potentiality than is generally believed. More knowledge is broadcast by printers' ink than by any other medium. For that reason alone the best time to advertise is all the time.

CARBON BLACK

GODFREY L. CABOT, Inc.

940 Old South Building
BOSTON, MASS.

AGENCIES IN
New York City Philadelphia
San Francisco Pittsburgh
St. Louis Cincinnati

611 Metropolitan Building
AKRON, OHIO

. 1, 1926

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